

CLEAN AIR ACT AMENDMENTS OF 1989

HEARING
BEFORE THE
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
OF THE
COMMITTEE ON
ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE
ONE HUNDRED FIRST CONGRESS
FIRST SESSION

ON

S. 816

A BILL TO CONTROL THE RELEASE OF TOXIC AIR POLLUTANTS, TO REDUCE THE THREAT OF CATASTROPHIC CHEMICAL ACCIDENTS, AND FOR OTHER PURPOSES

AND

S. 196

A BILL TO CONTROL EMISSIONS OF AIR POLLUTANTS FROM MUNICIPAL WASTE INCINERATION UNITS, TO PROVIDE FOR THE SAFE DISPOSAL OF ASH PRODUCED BY SUCH UNITS, AND FOR OTHER PURPOSES

PART 1

SEPTEMBER 21, 1989

Printed for the use of the
Committee on Environment and Public Works



U.S. GOVERNMENT PRINTING OFFICE

24-118

WASHINGTON : 1989

5321-1

For sale by the Superintendent of Documents, Congressional Sales Office
U.S. Government Printing Office, Washington, DC 20402

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

QUENTIN N. BURDICK, North Dakota, *Chairman*

DANIEL PATRICK MOYNIHAN, New York

GEORGE J. MITCHELL, Maine

MAX BAUCUS, Montana

FRANK R. LAUTENBERG, New Jersey

JOHN B. BREAUX, Louisiana

HARRY REID, Nevada

BOB GRAHAM, Florida

JOSEPH I. LIEBERMAN, Connecticut

JOHN H. CHAFEE, Rhode Island

ALAN K. SIMPSON, Wyoming

STEVE SYMMS, Idaho

DAVE DURENBERGER, Minnesota

JOHN W. WARNER, Virginia

JAMES M. JEFFORDS, Vermont

GORDON J. HUMPHREY, New Hampshire

DAVID M. STRAUSS, *Staff Director*

ROBERT F. HURLEY, *Minority Staff Director*

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

MAX BAUCUS, Montana, *Chairman*

DANIEL PATRICK MOYNIHAN, New York

GEORGE J. MITCHELL, Maine

FRANK R. LAUTENBERG, New Jersey

JOHN B. BREAUX, Louisiana

BOB GRAHAM, Florida

JOSEPH I. LIEBERMAN, Connecticut

JOHN H. CHAFEE, Rhode Island

ALAN K. SIMPSON, Wyoming

DAVE DURENBERGER, Minnesota

JOHN W. WARNER, Virginia

JAMES M. JEFFORDS, Vermont

GORDON J. HUMPHREY, New Hampshire

CONTENTS

AIR TOXICS

OPENING STATEMENTS

	Page
Baucus, Hon. Max, U.S. Senator from the State of Montana	1
Breaux, Hon. John, U.S. Senator from the State of Louisiana	4
Chafee, Hon. John H., U.S. Senator from the State of Rhode Island	2
Durenberger, Hon. Dave, U.S. Senator from the State of Minnesota	7
Jeffords, Hon. James M., U.S. Senator from the State of Vermont	48
Lautenberg, Hon. Frank R., U.S. Senator from the State of New Jersey	3
Lieberman, Hon. Joseph I., U.S. Senator from the State of Connecticut	5

WITNESSES

Cooper, Ben, Clean Air Working Group	54
Written statement	277
Doniger, David, National Clean Air Coalition	28
Written statement	181
Letter to Senator Baucus	198
Graham, John, Department of Health Policy and Management, Harvard School of Public Health	30
Written statement	209
Maillet, Bruce, State and Territorial Air Pollution Program Administrators ...	10
Written statement	60
McBrayer, H. Eugene, Chemical Manufacturers Association	12
Written statement	88
Letter to Senator Baucus	151
Miele, Robert P., California Association of Sanitation Agencies	56
Written statement	290
Miller, Robert P., Great Lakes Environmental Administrators	26
Written statement	174
O'Keefe, William, vice president, American Petroleum Institute	53
Written statement	238
Poje, Gerald, National Clean Air Coalition	13
Written statement	155
Williams, Walter, American Iron and Steel Institute	33
Written statement	215

ADDITIONAL MATERIAL

S. 816	334
Statements submitted for the record:	
Abrams, Hon. Robert, attorney general, State of New York	297
Alliance of Textile Care Associations	309
American Textile Manufacturers Institute	312
National Association of Metal Finishers	317
Screen Printing Association International	320
Sierra Club	323

INCINERATION

OPENING STATEMENTS

Baucus, Hon. Max, U.S. Senator from the State of Montana	407
Chafee, Hon. John H., U.S. Senator from the State of Rhode Island	408

IV

	Page
Durenberger, Hon. Dave, U.S. Senator from the State of Minnesota.....	409
Graham, Hon. Bob, U.S. Senator from the State of Florida.....	408

WITNESSES

Denison, Richard, senior scientist, Environmental Defense Fund	414
Written statement.....	450
Etter, Roger, chairman, Waste Combustion Institute.....	416
Written statement.....	483
Hershkowitz, Allen, senior scientist, Natural Resources Defense Council	422
Written statement.....	524
Moore, Allen, president, National Solid Waste Management Association	418
Written statement.....	491
Norton, John, the American Society of Mechanical Engineers	420
Written statement.....	514
Stallwood, Burton, National League of Cities	410
Written statement.....	430
National Municipal Policy.....	440
Todd, Barbara Sheen, county commissioner, Pinellas County, Florida.....	412
Written statement.....	442

ADDITIONAL MATERIAL

S. 196	540
Wheelabrator Environmental Systems, Inc., statement of	531

CLEAN AIR ACT AMENDMENTS OF 1989

S. 816, THE TOXICS RELEASE PREVENTION ACT OF 1989

THURSDAY, SEPTEMBER 21, 1989

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION,
Washington, DC.

The subcommittee met, pursuant to notice, at 9:39 a.m., in room 406, Dirksen Senate Office Building, Hon. Max Baucus (chairman of the subcommittee) presiding.

Present: Senators Baucus, Chafee, Lautenberg, Breaux, Lieberman, Durenberger, and Jeffords.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The committee will come to order.

Today marks the beginning of several days of hearings that will go almost from dawn to dusk on legislation to reauthorize the Clean Air Act.

Today's hearing will focus on air toxics legislation, S. 816; and on S. 196, legislation to control municipal waste incineration air emissions and ash disposal.

Next Tuesday we will hear from Administrator Reilly on the President's clean air proposal.

For the next two weeks we will hear from dozens of experts on nonattainment and acid rain. Markup of clean air legislation will begin after the Columbus Day recess, and we expect to finish by November 10. This is an ambitious schedule, but we hope to stick to it.

Today the focus is air toxics and incinerators. The problem of toxic air emissions is not new. In 1970, Congress required the Environmental Protection Agency to list every hazardous pollutant likely to cause illness or death. In the nearly two decades that have passed, we don't have much to be proud of. Since 1970, EPA has listed only seven pollutants—seven out of the 708 toxic pollutants by States.

Earlier this year we learned—due to reporting requirements mandated by Congress—that large volumes of these pollutants are released. In 1987, alone, EPA estimated that 2.7 billion pounds of

toxic chemicals were released in the air from large and small sources and from accidental releases.

We also learned that these releases are responsible for serious health problems throughout our Nation—particularly for people living near large industrial areas.

For example, estimates by the EPA indicate that some persons living near industrial facilities releasing 1,3 butadiene routinely face cancer risks as high as three people in ten. In 1987, alone, over nine million pounds of 1,3 butadiene were released in the air.

In a study of the South Coast Air Basin, over 220 cancer deaths per year in the Los Angeles area alone, are predicted from the mix of air pollutants from industrial sources, highway fuels, and small businesses.

Yet, in another study by EPA they predict that perhaps 2,000 people nationally could get cancer due to exposure to some 15 to 40 toxic air pollutants.

I could go on, but these three examples illustrate the point that without stronger legislation the problem will worsen.

S. 816 provides a concrete approach to reduce these emissions, requires maximum available control technology to reduce these emissions, and sets up a realistic schedule for applying MACT.

It also provides a safety net to assure that toxic air emissions will not cause cancer in more than one person in one million. In some cases, MACT cannot assure this protection. The legislation provides additional public health protection. The bill sets a cancer risk of one in one million as a basis for more controls.

Some are critical of this approach. The Administration, as well as some affected industries, believe that a hard and fast threshold is the wrong way to go. They prefer discretion in deciding what is significant risk. Their idea of a safety net is one that catches us, I believe, after we hit the ground. But I believe protecting public health is far too important to leave to chance. The safety net must catch us in the air.

How safe is safe is a judgment call, and I believe that Congress should be the judge.

We have a long list of witnesses today. I see several Senators are already here. I look forward to their views on this legislation. I also look forward to some very productive hearings in which we will hopefully have enough information that we can achieve a very significant bill when we finally mark it up.

I will now turn to the ranking member, a very valuable member of this committee, Senator Chafee.

OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR FROM THE STATE OF RHODE ISLAND

Senator CHAFEE. Thank you very much, Mr. Chairman. Again, I want to congratulate you for moving on with this hearing today and the other hearings that we will be having.

I must say, in listening to you outline the schedule for the subcommittee, it brings home to us the nightmare of the Senate's schedule that's before us. You serve so ably on the Finance Committee where, as you know, we're dealing with catastrophic, drug legislation, reconciliation, capital gains, and IRA. We've got two

trials coming up before the Senate—Judge Hastings and Judge Nixon. And so it is going to be very, very arduous to keep up and get full attendance at these hearings that we're going to have on the clean air legislation.

We have got two bills before us: S. 816, which was introduced by Senators Durenberger, Lautenberg, Breaux, and other members of the committee; and S. 1490, the President's proposal.

There are large areas of agreement between these two bills, which is good news. Both recognize the current method for regulating air toxics is ineffective. Both propose best technology approach to reducing toxic pollutants. Both provide for a second phase control program in the event significant health risks remain after the technology has been applied.

But the differences? The committee bill attempts to address the difficult problem of area sources. These are the small operations—the dry cleaners, service stations, print shops, and many others—as well as automobiles. They are small sources, but they all add up to 75 percent of toxic air pollution. To ignore these it seems to me would be in error.

The regulatory programs that are appropriate for large industries may not work for small and diverse sources such as I have mentioned. So the committee will be looking for innovative ways to assure reduction in those sources.

The committee bill also requires measures to prevent the occurrence of sudden and possibly catastrophic releases of deadly air pollutants. The President's bill is less explicit on that.

I want to congratulate Senators Durenberger, Lautenberg, Breaux, and others who have worked on S. 816, and all those who had a hand in preparing today's hearing. I look forward to it. Thank you, Mr. Chairman.

Senator BAUCUS. Thank you, Senator.

Senator Lautenberg.

OPENING STATEMENT OF HON. FRANK R. LAUTENBERG, U.S. SENATOR FROM THE STATE OF NEW JERSEY

Senator LAUTENBERG. Thank you.

Mr. Chairman, I want to commend you, also, for calling today's hearing on S. 816, the Toxic Release Prevention Act.

This bill requires EPA to establish a new program to control routine and accidental emissions of air toxics. These toxics can cause illness and death.

Earlier this year you asked Senators Durenberger, Breaux, and myself to take the lead in developing this legislation. We engaged in the difficult process of reconciling competing points of view. This bill represents compromise and, as with any compromise, there are aspects of it that I would have drafted differently had I introduced the bill exclusively on my own. But I believe that we have significantly increased the likelihood of passing strong air toxics legislation by working cooperatively at this time. And what is most important is that we want to pass a strong air toxics bill.

There has been much controversy over some of the provisions in the bill, and we are obviously going to hear about these differences today. That's the purpose, perhaps, of our hearing. But there are a

number of important considerations on which there is no disagreement.

There is no disagreement that air toxic emissions are too high—at least 2.7 billion pounds in 1987, according to the right to know data, and significantly higher when we account for sources of emissions not included in the right to know program.

There is no disagreement that emissions of air toxics can adversely affect human health. A number of studies have estimated that emissions of air toxics result in thousands of additional cancer cases a year and other adverse effects to human health.

There is no disagreement that emissions of air toxics can adversely affect the environment. In the Great Lakes, a significant percentage of toxics are deposited from there. A draft EPA report on atmospheric pollutants in coastal waters prepared in response to an amendment that I had offered to last year's EPA appropriations bill says that the atmosphere may be an important source of toxics to estuaries and coastal waters.

Further, there is no disagreement that technology exists to reduce emissions of air toxics. Many companies were unaware of the amounts of material until they prepared their section 313 reports. A number of these companies have now publicly promised to reduce significant amounts of these pollutants. As a matter of fact, in some areas of New Jersey we have already seen significant reductions by companies that took the initiative because they knew that was good corporate citizenship and they felt that they had an obligation to get on with it before regulations forced them to do it, so it was better public relations to do it voluntarily.

There is no disagreement that some chemicals are extremely hazardous and that, if not handled properly, pose significant risk of accidents. According to EPA, there have been over 300 deaths and almost half a million people evacuated between 1982 and 1986 as a result of chemical accidents. At least 17 of these events had the potential for more damage than occurred at Bhopal.

Finally, there is no disagreement, Mr. Chairman, that the existing air toxics program at EPA is broken and needs to be fixed. In 18 years, EPA has regulated only a few sources of just seven toxic chemicals, and I believe we can and must pass a strong air toxic program. The American public is expecting no less.

Mr. Chairman, today, as we begin the process for developing a clean air bill, I look forward to working with you and other members of the Environment Committee in moving clean air legislation as expeditiously as possible.

Senator BAUCUS. Thank you very much.

Senator Breaux.

OPENING STATEMENT OF HON. JOHN BREAUX, U.S. SENATOR FROM THE STATE OF LOUISIANA

Senator BREAUX. Thank you very much, Mr. Chairman.

I also join with members of the committee in this Herculean task of having the hearings necessary for us to develop the legislation. It is a very ambitious schedule. I know I have tried to get this committee room for a markup in my subcommittee, and they told me that in 3 weeks I could have it at 5:00 in the morning.

They told me it was going to be booked every day for eight hours a day by this subcommittee. It is, indeed, a very ambitious task.

I hope that we will be successful in developing a bill that can be presented to the President for his signature. I do not see this as an effort to make a political statement. It should be an effort to get a bill passed and signed into law. That's going to take some compromises that I would hope everybody is willing to make, because if we are not, we will make a political statement and will not make a law. I would hope that we will make a law, and that's going to entail compromises on the part of everyone. Certainly the views that I represent would be subject to those compromises; as well, I would hope other views would also be willing to meet that middle ground if we are going to be successful.

The second point I would make is that there is a great deal of mistrust—and I could argue successfully, I think — with regard to the way EPA has handled this program in the past. The record is quite dismal. That does not necessarily mean that a new administrator and a new administration could not do an adequate and sufficient job.

I would argue with those who would say that we should put ourselves in the position of EPA. Listing every minute detail in the legislation in order to see that it is carried out is the wrong approach. This committee cannot be EPA. We have to set standards, we have to set rules, we have to set goals, and we have to enforce them. But we cannot be so particular as to replace those scientists and experts that have to be involved in the regulatory process.

Therefore, I am a little concerned with some of the approaches that I have seen that, after we put forward the maximum available control technology on the various sources of these pollutants, that we then take the next step and come up with formulas that are so tightly drawn that it may be very difficult to decide whether, in fact, we have the right approach.

So there are some real areas of controversy with regard to risk assessment and how safe is safe and to what "ten to the minus what" is acceptable to human society as we try and achieve a balance between those who must, in fact, produce the products that make this country run—many of which are health products, I might add—and the need to try and reach a standard where everybody can feel safe with regard to the air that we breathe and the environment we live in.

So I would hope that as we move forward we will get the testimony we need to write a balanced bill.

Thank you.

Senator BAUCUS. Thank you very much, Senator.

Senator Lieberman.

**OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S.
SENATOR FROM THE STATE OF CONNECTICUT**

Senator LIEBERMAN. Thank you, Mr. Chairman.

I have a statement which I would ask be included in the record.

Mr. Chairman, this is an important day in that it signifies the beginning of consideration of the most important bill before this committee. I consider myself fortunate, in that sense, to have ar-

rived this year after all of you have been working so hard on clean air legislation, because this appears to be the session in which clean air legislation will be adopted. Everyone agrees with that.

The question that confronts us on air toxics, as it does on other parts of the bill, is: How clean will the air be? How clean will the bill be? How much will we seize the moment and really act decisively? Because what is on the line in air toxics certainly is people's health.

Statistics that Senator Lautenberg and you have cited are clear. Something else is clear just from the opening statements here. Often in Congress when reform proposals are made one of the responses is, "If it ain't broke, don't fix it." I think people of all persuasions and perspectives on this problem conclude that the current system for regulating air toxics is broke and does need to be fixed, and it needs to be fixed because people are getting sick. Some are dying prematurely as a result of the toxic chemicals in the air.

I look forward to this hearing and the testimony and working with members of this committee to produce the strongest possible clean air bill.

Thank you, Mr. Chairman.

[Senator Lieberman's statement follows:]

OPENING STATEMENT OF HON. JOSEPH I. LIEBERMAN, U.S. SENATOR FROM THE STATE OF CONNECTICUT

Thank you, Mr. Chairman, for holding this hearing on air toxics and air emissions from incinerators. I commend our chairman, Senator Burdick and Senators Durenberger, Lautenberg and Breaux for their hard work in crafting these bills.

I would also like to welcome Eugene McBrayer of Exxon Chemicals based in my home state of Connecticut who will be testifying on behalf of industry groups today and to add my welcome to my former colleague, Attorney General Robert Abrams of New York who has taken a leading role in working in this field.

The legislation the Committee has introduced will, first, entirely restructure the air toxics program and, second, give us the power to control the accidental and catastrophic releases of extremely hazardous substances which have the potential to kill or injure vast number of persons.

The risks to the American public from releases of routine air toxics from industrial facilities also pose a major health threat. According to EPA statistics, about 140,000 Americans alive today will one day die of cancer caused by air toxics. This risk is particularly high for those who live in urban areas, where one excess cancer death for every 1,000 persons is not unusual.

Even these figures may underestimate the extent of the problem. A study in 1987 by the South Coast Air Basin in Southern California projected that cancer incidences linked to toxic air pollutants was as high as 500,000 cases for those Americans now alive.

Toxic emissions also can cause serious illnesses besides cancer including birth defects, damage to the brain or other parts of the nervous system, reproductive disorders and genetic mutations. In the case of emissions of some neurotoxins, even small doses can be lethal.

Although there have been no quantitative assessments of the noncancer risks created by toxic emissions, in 1987 EPA ranked the noncancer risks created by over 30 environmental problems. Toxic emissions ranked as the second greatest threat to human health, exceeded only by the health risks attributable to ozone and other pollutants such as carbon monoxide.

Toxic emissions can also do damage to the world around us. Studies show that atmosphere deposition contributes more than 50 percent of the PCBs in the upper great lakes, contaminating the fish. Young children, because of their small body weight, are especially vulnerable to PCB-contaminated fish.

The conclusions of a recent study by the National Wildlife Federation are particularly alarming. According to the report, the contamination of Lake Michigan's fish poses an increased risk of cancer to those who eat them. It states that a person who

eats just seven meals of lake trout over a lifetime is running a 1 in 100,000 risk of getting cancer.

The second part of the legislation deals with accident prevention. During the years between 1980 and 1985, EPA statistics show that there were 6,928 accidents releasing 400 million pounds of toxic chemicals into the air, causing 138 deaths, 4,717 serious injuries, and the evacuation of 217,000 people. A recent EPA survey found that chemical accidents more toxic than the 1984 Bhopal India chemical disaster—which killed 3,400 people and injured 200,000—have occurred in this country at least 17 times. Our citizens were saved simply because the wind conditions were favorable.

Industry's response to this threat does not provide comfort. In 1988, EPA completed a survey of how 150 industrial facilities prevent, detect and respond to accidental releases. The survey found widespread deficiencies in current industrial practices. For example, only ten percent of the facilities trained employees in hazard evaluation or accident prevention. More than one third of the facilities had no preventive maintenance programs. Few facilities used emergency backup systems, such as emergency power or cooling systems, to prevent accidental releases.

By addressing two real problems—the ongoing, routine release of chemicals in the air, and the unplanned, accidental release of chemicals—this legislation goes a long way toward securing a safer environment for ourselves and our children. It takes advantage of technological advances to control routine emissions, and it takes heed of historical disasters to plan for catastrophic release.

I look forward to the testimony this morning on these critical issues.

Senator BAUCUS. Thank you, Senator.

Senator Durenberger.

OPENING STATEMENT OF HON. DAVE DURENBERGER, U.S. SENATOR FROM THE STATE OF MINNESOTA

Senator DURENBERGER. Mr. Chairman, thank you for the opportunity. I regret arriving late. We're both members of the Bipartisan Commission on Comprehensive Health Care, which is supposed to do what Congress can't do on catastrophic. We're meeting downstairs right now.

Mr. Chairman, some of the testimony we're going to receive today will maximize the health threat posed by toxic air pollutants.

In 1985, the Environmental Protection Agency released a report estimating the annual cancer death toll from air toxics at about 2,000. Industry witnesses will take that figure and compare it to the public health calamity that is caused by tobacco smoke and suggest that exposure to air toxics is not a serious public health problem.

To me, that's something like comparing the deaths from drug violence in D.C. to the slaughter of World War II and Vietnam, and then concluding that drugs aren't really much of a problem, either.

A very large number of Americans die of cancer each year. I think the number is 850,000 cases, of which more than 400,000 are fatal. Currently, cancer is attributable to environmental causes—a small percentage of that total.

But even the small percentage is cause for public concern. If the EPA figures are right—and I'll dispute them in just a minute—that would mean that 140,000 of the Americans that now live would die from a cancer caused by toxic air emissions.

There are other estimates which put the annual incidence much higher. A study by the South Coast Air Basin put the annual death toll in L.A., alone, at more than 200 annually.

Extrapolated to the entire population, that's 500,000 cancer cases from air toxics during the average 70-year lifetime of Americans now living.

And these estimates are based on studies of only a small number of pollutants. The EPA estimate is based on a series of studies for 15 of 40 pollutants. The South Coast looked at 20 pollutants, not including products of combustion like dioxins and furans, which may be among the most potent threats. By way of comparison, the Administration's air toxics legislation lists 200 substances for control. So the estimate is based on a small spoonful of the chemical soup that now pours into the air. And that number only reflects cancer incidents. It does not measure the other health and environmental damage caused by the substances.

Only one-third to one-half of these chemicals are suspected of causing cancer. The rest are on the list because of other adverse effects—birth defects, genetic mutation, reproductive disfunction, neurotoxicity, damage to internal organs like the kidneys and the liver, accumulation in the tissue of fish and birds. In fact, many of the pollutants are ozone precursors. They are volatile organic compounds which, combined with nitrogen oxides in the atmosphere, form smog.

This bill would likely be justified from the standpoint of ozone controls, alone, not counting its impact on air toxics.

Requiring ten-ton sources of FOC's to install best available technology is not far beyond what will be needed if we are ever to achieve the national ambient air quality standard for ozone pollution. And it is probably cheaper than some of the other controls that we have included in the nonattainment bill just introduced.

So the figure 2,000 cancer deaths per year certainly doesn't capture the whole story. But even if it were a sound estimate, there is another aspect of the air toxics problem which must be understood as we go through this bill.

Dick Darman, who is the current head of OMB—the first one we had in the early 1980's, Dave Stockman, I remember being against acid rain legislation because he said it would cost \$4,000 a fish to clean up. But the current one is quoted in the press as saying:

We could better spend the money buying every American a pair of rubber-soled shoes, because the chance of being hit by lightning is about the same as the chance of contracting a cancer from air toxics.

That statement reflects a fundamental misunderstanding of the toxics problem that we must deal with in this committee. Lightning—the kind that Dick Darman talked about—is a random event spreading a small risk of death approximately evenly across the whole population. Toxic air pollution from industrial sources, on the other hand, is not random. The risks are unevenly distributed. Those living near large chemical and manufacturing plants or in chemical corridors face much larger risks than the general population. It is not just a question of incidents—small risks widely distributed. It is also a question of equity.

Will we expose a few to very high risks so that the rest of us may enjoy, unfettered, the societal benefits of the chemical revolution? That can't be justified by some esoteric discussion of national cancer statistics.

If there were a bolt of lightning out there with Dick Darman's name on it, you can bet he would wear rubber-soled shoes, however small the national death toll from lightning.

Those Americans living with the high risks of toxic air pollution are like lightning rods in our chemical society. They need the protection afforded by this bill.

In closing, Mr. Chairman, I would note that our first witness here today was also our first witness on this legislation back in 1987, and if one were to read his statements on that day and this one, it would look like there is no reason to come back, because Bruce is right where he was then—solidly behind this bill.

We put him on first today because he is about the only witness that has had anything positive to say about our bill. Everyone else came to tell us that air toxics legislation wasn't necessary, that it would hold back progress on acid rain, that our proposed legislation was unworkable, and Bruce was a lonely voice of support on the day of 1987. So we invited him back today so that he can bask in the warmth of a new consensus—we hope—for today those statements that he made in 1987 I think will be echoed by much of the testimony we hear from our other witnesses. I think they'll say toxics legislation is needed. I think they'll say that technology standards are an appropriate first phase, that residual risks should be controlled with a health-base standard, that area sources are a serious problem. The Administration even has the shadow of a chemical safety board in its bill.

So I say to Bruce and to the other State air pollution officials that he represents and has represented so well: thank you for being there from the beginning.

And to the chairman and the other members of the subcommittee who have worked so hard on this legislation to take off the rough edges and mold the pieces for a better fit over the last two years, I'd also express my appreciation and those of Frank and the others of us who have worked on this legislation for a long time. The unwavering commitment of the leadership of this committee to the fundamental principles embodied in this bill is about to be rewarded and we will, at long last, have a program that contains and controls air toxics in this Nation.

Senator LAUTENBERG. Thank you very much, Senator Durenberger.

Now we'll call the following witnesses to the table: Mr. Bruce Maillet, Mr. McBrayer, and Doctor Poje. If you would, please come forward.

Senator CHAFEE. Mr. Chairman, we've got a full list of witnesses today—a pretty heavy schedule. What's the system? How long are they each going to have?

Senator LAUTENBERG. Each of them is going to have five minutes to describe their life's work.

That should not reflect in any way on our estimate of the value of their testimony. They also know that the time is just not there to hear the statements fully. Their statements will be in the record.

We'll turn on the clock and mercilessly cut you off at the time the red light goes on.

So if that is sufficient, Senator Chafee, then we'll proceed.

Senator CHAFEE. We look for vigorous law enforcement.

Senator LAUTENBERG. In the order of the request to go to the witness table, first Mr. Maillet, then Mr. McBrayer, then Doctor Poje.

We are especially pleased that S. 816 specifies a benchmark by which to evaluate individual risk from carcinogens. Further, the bill's limit of one in one million appears to be consistent with risk limits already being used in a number of States. The associations do, however, suggest that the risk reduction program in S. 816 be strengthened.

STAPPA and ALAPCO have significant concerns with respect to the residual risk component of S. 1490, which does not contain a benchmark for measuring individual risk and which provides the EPA Administrator with full discretion to decide if a second phase of controls is even necessary.

The federally enforceable State and local permit programs established in both bills are endorsed by our associations. We are particularly gratified that permittees are required to pay an annual fee to offset all direct and indirect costs associated with administering a permit program. The availability of these resources will be vital to an effective control program. We recommend that the fee programs of both bills be expanded to account for the significant contribution of air toxics from area and mobile sources.

Our associations are extremely concerned, however, with provisions in both bills that allow EPA to veto permits on a case-by-case basis. We find this level of oversight to be inappropriate, redundant, and wasteful, and have offered an alternative in our written statement.

The inclusion in S. 816 of a specific program to address area sources of toxics air pollution is supported by our associations, although we recommend that the bill mandate specific requirements for such a program rather than allow EPA five years to identify such measures.

We are concerned that S. 1490 includes only very general provisions with respect to the control of area sources.

The associations also note that neither bill contains a comprehensive regulatory program to control air toxics from mobile sources. Accordingly, we recommend that EPA be required to set regulations to control toxic air pollutants from motor vehicles. We are encouraged that both bills allow EPA to delegate responsibility for air toxics programs to States. We would also like to stress the active and vital role that local agencies play in controlling air toxics.

S. 816 also includes very appropriate provisions to address the adverse environmental effects from air toxics. We believe that these provisions will, among other things, help protect the Great Lakes from atmospheric deposition of toxic air pollutants.

Finally, the associations endorse the general principles around which S. 816 structures its program to address accidental releases.

In conclusion, STAPPA and ALAPCO compliment this subcommittee for its leadership in developing a strong and comprehensive program to effectively reduce risks from exposure to toxic air pollution. We commend your effort and offer our cooperation as you continue to address this very complex issue.

Thank you.

Senator BAUCUS. Thank you, Mr. Maillet.

Next we will hear from Mr. Gene McBrayer.

STATEMENT OF H. EUGENE McBRAYER, PRESIDENT, EXXON CHEMICAL CO.; CHAIRMAN, EXECUTIVE COMMITTEE, CHEMICAL MANUFACTURERS ASSOCIATION, CLEAN AIR WORKING GROUP

Mr. McBRAYER. Mr. Chairman and members of the subcommittee, I'm Gene McBrayer, president of Exxon Chemical Company. I'm also chairman of the Executive Committee of the Chemical Manufacturers Association.

On behalf of the CMA, I welcome the opportunity today to testify on proposed amendments to the Clean Air Act relating to air toxics. CMA and its member companies account for about 90 percent of the basic U.S. chemical capacity.

We in the CMA support legislation to further reduce emissions. Our members are, today, voluntarily reducing emissions, and we support legislation to accomplish that same objective. It is critical, however, that the reductions be accomplished in a balanced and reasonable fashion.

Inherent in our support for the new legislation are several key concepts that I'd like to highlight briefly today.

First: practical, effective, technology-based standards should be applied to sources with emissions that really need control.

Second: a concerted effort should be made to improve risk assessment techniques to realistically estimate actual risks to human health.

Third: after development of improved risk assessment techniques, additional controls should be applied to those sources that are still found to pose unreasonable risk.

Fourth: legislation should provide incentives for existing sources to reduce emissions before implementation of new standards.

Now, I'd like to discuss these concepts as they relate to the proposed legislation and then briefly highlight several other points covered in CMA's written statement.

CMA supports the basic framework used in S. 816 and S. 1490 in setting technology-based standards which would be followed by an evaluation of residual human health risks. But we are seriously concerned about the overly stringent level of control required by both bills.

Requiring the absolute best control achieved by any source, no matter what the circumstances, will result in excessive cost with little or no benefit.

Air quality will be improved most rapidly through the early implementation of effective, practical, and commercially available controls.

Health risk assessments are very complex and controversial; therefore, CMA believes that an independent, scientific group, whose work would be peer reviewed, should study and advise EPA on appropriate methodology for assessing residual risks.

EPA's current methodology for estimating risk uses multiple assumptions that virtually guarantee a dramatic overstatement of actual risk. Therefore, legislation should not specify risk levels when the methodology is inadequate to realistically estimate actual risk.

With improvements in methodology, the residual risk assessment step provides a meaningful basis for evaluating the need for additional controls. Such an evaluation should be based on the actual level of emissions and exposure conditions after application of technology-based control.

Next, the regulatory framework established by new legislation should be flexible enough to provide incentives for sources to reduce emissions before implementation of the new standards.

My company and many others have achieved significant reductions and are committed to further progress. In addition, CMA has adopted formal policies and programs supporting member company efforts to achieve continuous improvement in further reducing emissions. These efforts can have a major, positive impact on air quality. Neither bill adequately addresses this point.

Before closing, I'd like to highlight additional points which are covered more fully in our written statement.

We believe the permitting process in S. 1490 is cumbersome and wasteful. Both bills contain permitting provisions that may jeopardize continued operations. We strongly recommend a self-certification process, as used in existing section 112.

Another serious concern with S. 1490 lies in what we believe are unfair and onerous enforcement provisions, prescribing penalties grossly disproportionate with the offenses involved.

And, finally, while we support a coordinated Federal effort working with industry to address accidental releases, this effort must integrate EPA's role with the important ongoing activities of OSHA and other Federal agencies. S. 816 fails to meet this objective.

In summary, CMA intends to work constructively toward the passage of air toxics legislation that results in lower emissions and better understanding and better management of health risks.

Thank you.

Senator BAUCUS. Thank you very much, Mr. McBrayer.

The next witness is Mr. Poje.

STATEMENT OF DR. GERALD POJE, ENVIRONMENTAL TOXICOLOGIST, NATIONAL WILDLIFE FEDERATION, REPRESENTING THE NATIONAL CLEAN AIR COALITION

Mr. POJE. Thank you, Mr. Chairman.

My name is Gerald Poje. I am an environmental toxicologist working for the National Wildlife Federation. I'm testifying today on behalf of the National Clean Air Coalition, and I thank the Chair and members of the subcommittee for the opportunity to provide oral and written testimony on the legislative proposals to reduce the releases of airborne toxic chemicals.

The Coalition commends the subcommittee for bringing this important issue before Congress and for setting a rigorous schedule for addressing this in the next few months.

The Clean Air Coalition shares the national goal articulated by the President in June of this year when he said, "People living near industrial facilities should not have to fear for their health."

Any serious policy initiative to guarantee freedom from fear must incorporate provisions to reduce emissions of airborne toxic chemicals and to prevent chemical accidents.

With strengthening amendments, the Toxics Release Prevention Act of 1989, S. 816, would represent a strong, national solution to this problem.

I have focused my attention to the chemical accident provisions of this bill and will defer to David Doniger of the Natural Resources Defense Council on the positions for routine emissions control.

In order for communities around industrial facilities to live free from their fear, it is essential that the Clean Air Act reauthorization: one, establishes a Chemical Safety and Hazards Investigation Board to assure that chemical accidents will be subject to thorough investigations; two, that it promote chemical accident prevention by requiring industries to submit risk management plans; and, three, that it directs EPA to promote accident prevention by requiring EPA to develop and issue regulations which will promote chemical accident prevention technology and prevention management at industrial facilities.

In the wake of the tragedy at Bhopal, India, Americans became much more aware of the human health threat posed by chemical accidents. Despite existing legislation mandating emergency planning, and despite authorities in the Occupational Health and Safety Act, three points need to be emphasized: chemical accidents are not subject to thorough public investigation; chemical accidents occur frequently in the United States; and industrial facilities and communities are unprepared to understand and to respond to the consequences of chemical accidents.

I'd like to describe for the committee just one particular accident that occurred a little bit more than a year ago.

On May 4, 1988, in Henderson, Nevada, at the Pacific Engineering and Production Company, a catastrophic accident began just before noon. A fire had started in the crystallizing process unit which removes water from a particular chemical. This area had been the scene of previous fires. Water hoses spraying the fire proved unable to extinguish the flames, and fire fighting attempts ceased after part of the roof blew off of the building.

A sequence of four explosions followed within a minute of each other as large amounts of ammonium perchlorate were ignited.

Two hundred miles away in Pasadena, California, a seismograph at Cal Tech recorded two explosions measuring 2.9 and 3.5 of the Richter scale—equivalent to a 7½ kiloton warhead.

The accident killed two PEPCON employees, injured 250 others, and, in the blast area, injured a number of citizens, the youngest of which was a five-hour-old infant.

Shock waves shattered windows for miles around, blew automobiles into ditches, and disrupted power.

The American Insurance Association associates nearly \$100 million worth of property damage from this ten minutes' worth of explosion.

All of the workers have lost their jobs, and not more than 200 yards from the site all the workers at another facility have lost their job.

We need to emphasize that the frequency of accidents is often underestimated. EPA's acute hazard events data base put together a catalog of 11,000 events spanning eight years. In other words, a

partial list of chemical incidents in the United States provides a record of nearly four accidents every day.

According to EPA, these incidents resulted in 309 deaths, more than 11,000 injuries, and nearly 500,000 evacuations between 1980 and 1988. Seventeen of these accidents were rated as having a Bhopal potential consequences.

In 1986, EPA committed to a study that investigated preparedness in communities and at facilities and found general lacking efforts in the area of management's approach to accidents and the development of prevention systems and monitoring and detection systems, as well as in public alert systems.

People living near industrial facilities have reason to fear. Not only do routine emissions threaten long-term health and security; but chemical accidents pose a more serious threat to communities than is commonly understood. This threat could be substantially reduced through a national risk reduction program beginning with the Federal legislation as embodied in strengthened provisions of S. 816.

Thank you.

Senator BAUCUS. Thank you very much, Mr. Poje.

I'd like to ask Mr. McBrayer what you think of the risk assessment provisions in the bill.

Mr. McBRAYER. Mr. Chairman, you're referring to the provisions in S. 816?

Senator BAUCUS. Correct.

Mr. McBRAYER. We believe that the risk assessment provisions of S. 816 draw too tight a line for control. You're referring here to the risk assessment after we have achieved a significant reduction with technology-based standards.

We believe it is much more appropriate for us to put in place an effort to develop more appropriate risk assessment techniques that really measure the impact on human health, and then, based on those, tighten controls afterward.

Senator BAUCUS. What would those more appropriate techniques be?

Mr. McBRAYER. We think much more science and development has to be put into that. There is great imprecision today with the lines that are drawn on this, and that is our greatest problem with it—the impact of this imprecision.

Senator BAUCUS. But the question, though, is: what is the alternative? I agree that the risk assessment is not the most precise phenomenon in the world and there are some problems with it. But with any criticism of any approach of risk assessment, one has to ask what the alternative is.

To some degree the alternative—that is, current law—hasn't done a good job either. Current law has not proved out very well, either. All these years have passed, and little has been done to get a handle on the chemical releases. So when I hear you describe your alternative it sounds somewhat similar to the current approach.

Mr. McBRAYER. Mr. Chairman, I disagree on that. I think there is a significant difference. The current section 112 deals with the risk assessment first. What we're proposing here, and I think the uniqueness of this bill, is going ahead, recognizing the imprecision

of the measurement of human health risk today, with a very aggressive technology-based control system that, in our opinion, will remove a large majority—maybe even 80 percent or more—of the toxic pollutants while we are developing more precision with this technique.

Senator BAUCUS. Isn't it true, though, that provisions in this bill have lots of different time periods? In fact, they are criticized by the environmental community as being too loose, too long—that is, that the risk assessment provisions really do not apply for 5, 6, 10, or 20 years before a plant is asked or forced to shut down because it has an unacceptable cancer risk. The time periods of this bill are very lengthy. As I said, they are being criticized by many in the environmental community as being too lengthy.

It seems to me, therefore, that this bill strikes a pretty good balance. You have criticized it as being a little too burdensome. But I think an argument can be made that if it takes 20 years before a plant has to be shut down, that might not be quite so burdensome. We could figure out a way in 20 years how to skin this cat.

Mr. McBRAYER. We clearly believe this bill is in the right direction, and we strongly support getting on and reducing air toxics.

As I said, we have a voluntary program to do it. We think, properly drafted, this will make a real difference. But drawing too hard a line in the sand as a number can be a mistake. I'm not an expert at risk assessment—I have many that are. But I do understand the difficulties of imprecision. It is sort of like agreeing that we have a 55 mile an hour speed limit, but having a radar system that can't tell whether you're going 5 or 55, and therefore always having, as a control, the 5 mile per hour speed in order not to overrun 55. That's just one order of magnitude difference. These risk assessment techniques are, I'm told, mostly two to three orders of magnitude imprecise, and sometimes more. That's the difficulty.

Senator BAUCUS. They are imprecise, but they are imprecise both ways. Industry can use them to be precise the other way, too. And actually, under the bill, one is only forced to compliance in an extreme after 23 years—not 20, but 23. That's quite a few years.

Senator Chafee.

Senator CHAFEE. Mr. Chairman, thank you.

I appreciate the testimony of Mr. McBrayer and CMA. We have worked with CMA for many years in this committee.

I wasn't quite sure that I understood your complaints about the maximum available control technology. Could you review that briefly again?

Mr. McBRAYER. Sure. I'll be happy to, Senator.

What we're suggesting is that we should have two different levels of technology standards—one for new installations, and then a different approach for existing installations.

We believe that in this first wave program of technology-based standards, to take the great majority of the air pollutants out of the air we need to be using technology that is reasonably and commercially available, rather than picking the one that perhaps is put on in some location based on some special circumstance that would do maybe 1 percent more recovery, but the benefit of that would be quite questionable.

I can give you a for instance. In our plants, for example, in recovering or destroying the emissions from process vents.

There is good and established technology, for example, that would vent those to flare stacks, which we could do quickly, quite effectively, and recover 90 to 95 percent of the emissions.

Another alternative that might be used in a pharmaceutical plant somewhere would be an incinerator to do that that would increase the recovery to 99 percent. Siting incinerators, adding that extra operating system, in our judgment, is not good application of MACT. So that's an example of what I'm talking about.

We would like to get on with technology that is readily available, in use, and understood, and would be readily welcomed by the voluntary programs in advance of the standard.

Senator CHAFEE. Thank you.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you.

Senator Breaux, you're next.

Senator BREAU. Thanks to the members of the panel for being here. I think I'm hearing something in your statements that indicates some cooperation and work on this legislation among the various groups. I hope that's true. Whether you're representing the chemical manufacturers, environmental groups, or State and local governmental units, each of you and the constituents that you represent have enough force politically to stop this bill from being passed. I would offer to say that none of you have enough support individually to get it to pass. The point I'm making is that this is going to have to have some cooperation and work among the various groups. I encourage you to meet outside of this room, as well as while you are in this room, to talk about what is feasible and what is doable in the real world.

I am convinced that any one of you, if you don't like the product that goes to the Senate floor, is going to have enough support to kill it. It is only going to be if you all are working together that we're going to have enough support to pass it.

Having said that, I commend you for what I feel is some work within the groups and organizations as well as before the Congress in order to get something that is sufficient.

No one trusts EPA—at least most people didn't trust the last eight years. The question is to put on the maximum available control technology and then decide if it is working. How we decide if it is working is the essential question that is bothering a lot of people from all the different groups and organizations.

I do not understand—maybe because I haven't had it fully explained to me, the "ten to the minus six," "ten to the minus five," the imprecision that is involved in that very technical assessment. How would you, Mr. McBrayer, solve the concern that people have in saying that EPA just cannot be relied upon to make a sufficient assessment of whether this is something that is going to take care of human health and the environment after you put on the technology?

Mr. McBRAYER. Senator Breaux, I believe the real solution to that is this independent peer reviewed scientific body. I think they can come up with some very good guidance that can help us better understand risk to human health from these materials while we

are in the process of significantly reducing the pounds of them in the air with the technology based standard.

Senator BREAUX. On a source-by-source, case-by-case basis—

Mr. McBRAYER. Yes.

Senator BREAUX. With the concept being a recommendation to EPA to follow or to consider? Maybe you don't have these particulars considered on it. I don't know.

Mr. McBRAYER. The major point is that they look at all of the available data and look at the linkage to human health—not just animal data—and taking the most conservative multiplication of factors in the process.

Senator BREAUX. Would EPA be bound by it, or is it a recommendation to EPA? Do you know yet?

Mr. McBRAYER. I don't know yet.

Senator BREAUX. I might ask the witnesses from other communities. Do any of you have any comments on that? Bruce?

Mr. MAILLET. I think the application of the control technology up front is going to go a tremendous distance in reducing the risk that individuals are exposed to now. That is something that I think we fully support.

Senator BREAUX. And it is front loaded because we are listing all of the chemical compounds and you have to have a burden to take them off.

Mr. MAILLET. True. It eliminates a lot of the debate as to whether it is a problem or not. We think the controls are pretty much already identified. They are there. They can be put on.

True, there is a difference between the new facilities and the existing facilities, and some of the existing facilities may require additional time to be able to get the controls in place at the same level of control.

Relative to the risk assessment issues, I think there is uncertainty surrounding a lot of those risk assessments. I think this is why we support the front-end technology, back-end risk assessment, because we are dealing with a small population of sources at that particular point in time.

Senator BREAUX. What are your thoughts on the risk assessment?

Mr. MAILLET. That EPA should develop the criteria for doing risk assessment and should have a body to help them in doing that—not to do the case-by-case, this is the way we are going to do risk assessment for this plant. But, in general, this is how we do risk assessment. Given what we know today, this is how we do risk assessment.

Senator BREAUX. And then apply that to each plant?

Mr. MAILLET. Yes.

Senator BREAUX. Okay.

Senator BAUCUS. If the Senator will yield? That exists today, doesn't it? Isn't there a Science Advisory Board that deals with risk assessment today?

Mr. MAILLET. They deal with risk assessment today, But I think they have to put more effort into establishing what that procedure is and the basis that they use so that it is better understood by all of the communities.

Senator BAUCUS. Thank you.

Senator BREAU. Let me ask another question with regard to the voluntary incentives, which I think are very important. We don't have enough pollution cops. We're going to be using them all to catch drug pushers, so we're not going to have enough pollution cops to go out there and enforce this.

There is a section in the bill relating to companies who are able to voluntarily reduce their emissions. If it is 90 percent, you don't have to do certain things.

I would like to see if it could be a graduated thing. There is no incentive to do 89 percent. I would like there to be an incentive to do 89 percent as well as 90 percent.

Mr. MAILLET. That's true, sir.

Senator BREAU. I'm not sure there is something that can be formulated to encourage them to do as much as they possibly can, as opposed to having an arbitrary 90 percent cutoff.

Any thoughts on that from anybody?

Mr. POJE. Senator, I would like to address that.

I think that there are some measures out there right now that do allow the public to play the role of pollution cop; namely, in looking at the information that has been gathered under the toxics release inventory program. This is an annual submission by industry of their toxic chemical releases. It has been made available to a number of people around the country. It is a publicly accessible data base through the National Library of Medicine.

Senator BREAU. I think that's good, but I don't want the general public doing the enforcement. They have the right to go to court and the right to proceed with the enforcers, but we're not going to have everybody delegated or deputized to enforce the rules.

Mr. POJE. Certainly, if we can play the role here of using the analogy that was used by Mr. McBrayer, citizens will be checking to see whether companies are going 55 in a 5-mile-an-hour zone in their communities.

Senator BAUCUS. Thank you very much, Senator.

Senator Lautenberg.

Senator LAUTENBERG. Thank you very much, Mr. Chairman.

Mr. McBrayer, you argue that we don't need additional regulations to prevent chemical accidents. But according to EPA, we have had thousands of chemical accidents that resulted in evacuation, injury, and even death. And the potential for damage has, in a few instances, been verified—or at least established by some review process—to possibly exceed the damage which resulted from the Bhopal accident.

In view of that kind of a record, why should we rely on industry's programs? Why not get to regulations? It is hard to understand how the argument can be made.

Mr. McBRAYER. Senator Lautenberg, first of all, we are in favor of some improvements in this regard.

Senator LAUTENBERG. Improvements? What?

Mr. McBRAYER. For example, in the case of S. 1490, we would support a chemical safety hazard investigation board. We think that would be a constructive step.

The point we'd like to make with regard to it is that it should be a coordinating body that takes into account the very good work that is under way today in this area by OSHA and does not rule

out the important roles of DOT and the Coast Guard with regard to transportation.

Already, OSHA has quite a lot of authority and has a good bit of expertise, which I must add that they're building on, which we believe is today having increased impact and will have more.

So we think a coordinated program, rather than a program that supersedes, would be constructive.

Senator LAUTENBERG. Well, again, as a record to point to which isn't terrific by a long shot, what happened is that once we made the information available under the right to know statute there was a lot more attention paid to this. There was a surprise and astonishment, even by some of the companies, at the volume of material that they were releasing. So that doesn't sound like voluntary programs or existing industry programs are doing the job. It is when they were exposed under the very bright lights that things began to happen.

Mr. Maillet, are States comfortable relying on voluntary or existing programs to control the emission?

Mr. MAILLET. I don't think that has been effective to date as far as voluntary programs. Most States, and an awful lot of local agencies, are moving forward on their own with their separate air toxics programs, and have been for a number of years, because that hasn't been there.

We do support the provisions that, given sufficient voluntary reductions, or already mandated State and local reductions, that those sources be given additional time before the MACT comes into play.

But, in general, we feel that a regulatory program must be in place to control the emissions of toxic air pollutants.

Senator LAUTENBERG. Mr. McBrayer, New Jersey is sort of home base for much of your operations.

Mr. McBRAYER. It certainly is, and we're proud of it.

Senator LAUTENBERG. I am, too. We want to make sure that we're all walking in locked step, however.

New Jersey's chemical accident prevention program requires industry to develop risk reduction programs, which have to be submitted to the State for review. Aren't there some sectors of industry that would stand to benefit from a requirement that such a plan be prepared and reviewed by outside experts?

Mr. McBRAYER. We are, of course, aware and are complying with that. This is being developed, and we are employing hazard assessment techniques that are common to the facilities that are involved.

We believe that the advantage of that system in that case is that we have the ability to use the appropriate techniques for the appropriate facility.

Yes, I agree that certain parts of New Jersey industry will likely benefit from that.

Senator LAUTENBERG. Has the New Jersey program been particularly burdensome?

Mr. McBRAYER. I think it is premature to tell. It is just really getting under way. I think how it plays out in the review process will tell us how burdensome it will be.

Senator LAUTENBERG. Well, how about the establishment of programs? You agree that there are some sections of the program that are valuable, and you're unwilling to admit that they're not particularly burdensome. I don't understand why, if they haven't been burdensome, why it is that we just can't admit that some regulation may, in fact, be of value?

Mr. McBRAYER. Senator, I would prefer to submit for the record an analysis of the New Jersey program. I, personally, am not familiar with the details of it. I would like to give you a thoughtful review of our opinions on the applicability of that more broadly and what it is doing for us in New Jersey.

Senator LAUTENBERG. I thank you very much, Mr. Chairman.

Senator BREAUX. The committee record will be open for two weeks.

Next is Senator Lieberman. Senator.

Senator LIEBERMAN. Thank you, Mr. Chairman. Good morning.

Mr. Chairman, while New Jersey is home to many of the operating facilities of Exxon Chemicals, Connecticut is home to its headquarters.

Mr. McBRAYER. We like that, too.

Being a long resident of Connecticut, I like that, too.

Senator LIEBERMAN. We welcome you. And I hope you'll understand, Mr. McBrayer, that my questions, as they focus on you, are in the spirit of neighborliness.

Let me begin. Clearly, a big element of disagreement here, or potential disagreement, is on the question of risk assessment. Let me just set the scene for you by saying what you've heard us say in our opening statements, which is that many of us are motivated in this air toxics area, as we are in the other elements of the Clean Air bill, by our concern about the effect on public health. EPA tells us that 140,000 Americans that are alive today are going to die one day because of air toxics. In some urban areas the risk is as high as one excess cancer death for every 1,000 persons. That's from routine emissions. The number of accidents they report goes up to almost 7,000 in the period from 1980 to 1985, 138 deaths, more than 4,700 injuries.

Does the CMA accept the premise that there is now a serious public health problem that is caused by air toxics?

Mr. McBRAYER. The adjectives, Senator, I guess I would have some trouble with. We strongly agree that there is an air toxics problem. Witness our voluntary reduction program.

We look at all of the data. We do epidemiology studies on all of our workers who have been in the closest proximity to these materials, and we follow their health for their 35 years with us plus retirement. We look very carefully at the connection between the materials we handle and their mortality. And we believe we're doing a very good stewardship of that and do not believe that the materials, in the concentrations that we are emitting, are causing serious public health problems.

But we would like to improve the margin of safety, and therefore we support the technology based approach, getting the great majority of the pollutants down. That's a double win. It's a win for society, and it is a win for our industry.

Senator LIEBERMAN. I agree.

So do you take issue with some of the numbers that EPA gives us?

Mr. McBRAYER. Yes.

Senator LIEBERMAN. In other words, the 140,000 cases of death by cancer because of air toxics of people who are alive today, you'd argue with that?

Mr. McBRAYER. Those are estimates, and I think we need to make sure the data is more correct before we do unreasonable things to bring the toxic load down.

Senator LIEBERMAN. Do your folks have criticisms of the EPA methodology in putting these statistics together? If they do, I'd be interested in seeing them.

Mr. McBRAYER. We'll be happy to submit that for the record, Senator.¹

Senator LIEBERMAN. Because I presume that if you accept the bottom line that they've given us of 140,000 premature deaths by cancer caused by air toxics, you would accept the adjective "serious" at that point?

Mr. McBRAYER. The 140,000 deaths is serious by anybody's measure.

Senator LIEBERMAN. Okay. Let me continue on a line that we've touched on it already in this questioning, and that is how EPA goes about its risk assessment now.

In your prepared statement, CMA has been pretty critical of EPA's risk assessment methodology. You've called it ultra conservative. At one point you said, "Their approach is intended to ensure inaccuracy."

Part of the problem—I'm a lay person, and I think all of us on the committee are—is how you draw the balance here. There is a natural instinct to want to draw the balance to err on the side of public health, and I presume that if somebody from EPA was here today, that's what they would say about why they adopt this approach to risk assessment.

Don't you agree that, as we make our determinations here, we in Congress have an obligation to err on the side of public health?

Mr. McBRAYER. I agree we should, and there should be factors of safety in these estimates, and we do that with our own estimates. But the problem we have—and I'll have to admit again, Senator, that I am not an expert in risk assessment, but I do know I have seen some of the results calculated on some of the materials we have produced where I am confident they over-estimate risks by at least two or three orders of magnitude, and it is because of scaling factors in the linear multi-stage model and taking animal data without a clear linkage to mechanisms into the human being and propagating the errors. We think there is ample room for adequate safety factors without going to that extreme.

Senator LIEBERMAN. My time is up on this round. Thank you.

Senator BAUCUS. Thank you very much, Senator.

Senator Durenberger.

Senator DURENBERGER. Chairman, thank you. I just have a couple of brief questions.

¹ See p. 151.

I'm interested in the discussion of the role of the chemical industry. I spent 8 years working for a chemical company, and I gave them legal advice and I gave them community affairs advice. I guess one of the things I learned about this whole process is something I'm now learning with some of my colleagues who are trying to develop a comprehensive approach to health care in this country: it just can't be done in any way that has ever been invented before. It is basically an adversarial process.

You know your business very well, and those of us who are in a position of trying to determine how your business affects other people are very dependent on your telling us how you are affected by what we do. Yet, sometimes the questions that you are asked seem to ask you to think of the larger societal good at the same time that you're thinking of the good of your entity. I think that is sort of difficult to accomplish.

However, in the process of trying to put this legislation together I have learned a whole lot about how the adversarial process eventually gives you about the best that a society is going to be able to come up with. The way this bill is drafted is sort of the result of that process.

We have now listened for better than three years to a lot of people on this general subject, and what you see before you in this bill is about the best that a whole bunch of folks who have come from a wide variety of backgrounds can do, and yet who believe that in the process of sort of an adversarial—not in an antagonistic way—but in an adversarial process you usually end up with a better approach to making the decisions everybody has to live with, and if we adopted one side or the other of that process.

At least I want to say that I hope we are much closer today than we were a couple of years ago to having a process that everyone can adequately deal with.

Mr. Maillet, I must ask you, in this whole discussion of how we deal with moving from health-based standards to something approaching it but not quite, and listening to the responses you made to some excellent questions from my colleague: your testimony uses the so-called "bright line, absolute standard of ten to the sixth power" as where we ought to be. In asking my colleagues to get on board this bill I sort of backed off. I've got ten to the six, but backed off, also, secondarily, to a second standard, this ten to the fourth power. I wonder if you'd mind telling us why you didn't have something to say in your statement about the secondary position that we took. Is it an inappropriate approach?

Mr. MAILLET. If you are referring to ten to the minus four as the first cut point as being inappropriate, I'm not sure that it is inappropriate for the existing facilities that would have to meet it. That is the first bench mark that we saw.

Also, the use of ten to the minus six—or one in one million—risk for an individual as a goal, we think is one that should be part of the bill. There are a number of States and local agencies right now that are using that as their bright line or their bench mark.

As was pointed out earlier, the time frame for achieving the ultimate goal is a rather long one, and we think that there should be sufficient push to get us there.

But I'm not sure that the ten to the minus four is an inappropriate place to have everybody beginning, and then moving those existing facilities that do not, after application of MACT, to achieve ten to the minus six. They should continue to seek ten to the minus six.

Senator DURENBERGER. So having two simultaneous standards like we have is not necessarily bad?

Mr. MAILLET. I'm not sure that they are two simultaneous standards. But if you can initially get by with ten to the minus six, then you are there. And I think most of the facilities are going to be there.

By the same token, if you can get, after application of MACT, to ten to the minus four, then perhaps there should be some additional time involved.

Senator DURENBERGER. Mr. Poje, you recommend a risk reduction program that is like the one included in the House bill. Could you briefly describe that for us? Is it like the New Jersey model that was discussed here earlier?

Mr. POJE. I think it has more of the elements that are in the California risk management reduction program. There are three States right now that have existing legislation dealing with chemical accident prevention—the State of Delaware, the State of New Jersey, and the State of California.

We see the elements of the risk management prevention program in California, as embodied in H.R. 2585 on the House side, as having several other elements in it that are currently lacking in the hazard assessment side of S. 816. In particular, the mandate to develop prevention programs and also to develop response plans would be a complete package of accident prevention provisions, and we would encourage you to entertain those ideas. We would be happy to work with you in flushing that out.

Senator DURENBERGER. Thank you.

Senator BAUCUS. Thank you, Senator.

Mr. McBrayer, I have one question. You said that the risk assessment may overstate the risk. There are some who say that it may understate the risk. Insofar as the models that have been developed, the risk assessments only deal with one particular substance. They do not take into account the synergistic effect of the interaction of one risk or one chemical with another chemical. For example, asbestos and cigarette smoking together I'm told have a geometric, rather than mathematic, result. The chance of cancer goes up geometrically, not arithmetically, when you combine those two substances together. Somebody who smokes who is in an asbestos environment faces that prospect.

I wonder if you and Mr. Maillet could comment on the degree to which potentially the present state of the art of risk assessment therefore understates the risk rather than overstates it.

Mr. McBRAYER. Mr. Chairman, I think the example you used of cigarette smoking and asbestos is well documented with human health epidemiology. The aggravation of lung cancer caused by the combination is shown in many, many cases.

I am not aware of any such linkage that has been shown with the materials we're talking about from the 313 list. Now, I know some speculate that there may be linkage, but I'm not aware of

any scientific linkage nearly to the degree or at all to the extent that exists in the case of the one you mentioned.

Senator BAUCUS. Mr. Maillet, could you comment on that, please?

Mr. MAILLET. I think the synergistic effects are one of those issues that certainly requires more study.

Mr. MCBRAYER. Agreed.

Mr. MAILLET. But you can look at the numbers of pollutants that are being monitored in some cities where there is increased risk of cancer that clearly show that something is going on.

We'd be happy to provide that information.

Senator BAUCUS. Please.²

Mr. MAILLET. A carcinogen or a chemical that is affecting a cell and causing cancer—whether it is this chemical or another one—is very, very difficult to identify. That's why, in our comments, we call for not just looking at the stationary sources, but also mobile sources and area sources, because they all contribute to the urban soup and the toxic soup that we are all faced with.

Senator BAUCUS. Thank you.

Senator Chafee, do you have some questions?

Senator CHAFEE. No questions, Mr. Chairman. I do want to stress that we've got 15 more witnesses.

Senator BAUCUS. I know we do. We'll get there.

Senator CHAFEE. We have got to press on.

Senator BAUCUS. Right.

Senator Lautenberg.

Senator LAUTENBERG. I would waive the opportunity.

Senator BAUCUS. Senator Breaux.

Senator BREAU. One quick question.

There are some who argue that the Federal role should be to set very tough, national standards, and that the States be required to follow them. Others will make the argument that perhaps it is better to have the Federal Government set minimum standards and allow individual States to come in with more stringent requirements than the Federal Government. Any thoughts on the two different suggestions?

Mr. MAILLET. I think the Federal Government should be setting the standards that are protective of public health and should be protecting all of the individuals right across the country. But, by the same token, should a local jurisdiction choose to give more protection to its citizens, that should be available to that particular jurisdiction.

Mr. MCBRAYER. We agree that the Federal Government should set the level of standards.

Mr. POJE. I would certainly agree with the same statement Mr. Maillet made.

Senator BAUCUS. Senator Durenberger.

Senator DURENBERGER. No.

Senator BAUCUS. Gentlemen, thank you all very much for your testimony. We appreciate it very much.

² See p. 75.

Our next panel consists of: Doctor Robert Miller, Director of Air Quality, Michigan, testifying on behalf of the Council of Great Lakes Governors; Mr. David Doniger, Senior Attorney of the Natural Resources Defense Council, on behalf of the National Clean Air Coalition; and Doctor John Graham, Department of Health Policy and Management, Harvard School of Public Health.

Attorney General Robert Abrams was scheduled to testify this morning. He tried to get to the airport, but due to a crash last night there is consternation at LaGuardia and it is very difficult for him. He is unable, in fact, to catch a plane to come down this morning. In his place, I'd like to ask that Walter Williams, the Chairman and CEO of Bethlehem Steel, also be on the panel.

I'm told that Doctor Graham is over at the House, but will be over here as soon as he can make it.

Let's begin with Robert Miller. Mr. Miller.

**STATEMENT OF ROBERT P. MILLER, DIRECTOR AIR QUALITY,
STATE OF MICHIGAN, REPRESENTING THE GREAT LAKES ENVIRONMENTAL ADMINISTRATORS**

Mr. MILLER. Thank you for inviting me to testify on air toxics legislation today. And thank you, particularly, to Senator Durenberger for introducing S. 816 and for your mention of the Great Lakes in your introductory comments.

I am Bob Miller. I'm director of Michigan's Air Pollution Control program. I appear here today on behalf of the Great Lakes Environmental Administrators under the auspices of the Council of the Great Lakes Governors.

I am here today to try to talk to you about one of the most important environmental issues confronting the Great Lakes Region, and I hope I'll be able to convince you one of the important environmental issues facing the entire nation.

As I was trying to clear my mind last night of what faced me this morning, I was forcing my mind to think about my trip up north that I have planned in two weeks. As I was doing that, an image came to mind that sort of put in focus the message that I want to give you this morning, and that was the image of a father and son going north on a fishing trip sitting around the camp fire preparing the fish that they caught during the day, but having to be worried about whether eating those fish was going to affect their health.

That brought to mind another image: a pack of cigarettes and the Great Lakes. The Great Lakes, like a pack of cigarettes, contain a warning, just like the Surgeon General's warning, that says, "Caution: eating this product can be hazardous to your health."

There are fish advisories regarding consumption of fish throughout the Great Lakes region. The States of Wisconsin, Minnesota, Illinois, Indiana, Michigan, Ohio, and New York all have fish advisories regarding eating certain species of fish from the Great Lakes.

It is not a problem, though, just faced by the Great Lakes. It is clear in our minds, from the research we have looked at, that there are contaminants at levels of concern in the Great Lakes—and not just the Great Lakes, but in our inland water. Wisconsin looked in

their inland lakes and they found levels of concern and put fish advisories on inland lakes. That inspired Michigan to look at Michigan's inland lakes, and we now have a fish advisory for every lake in the State of Michigan against eating some species of fish or moderating your consumption of fish because of the mercury levels in them. And we feel that as other States start to look, they're going to find similar problems.

Now, of course, some of the pollutants come from direct water discharges. However—and here is one of my key points — research indicates that air toxic deposition contributes from 46 to 99 percent of the lead that is found in the Great Lakes, up to 90 percent of the PCBs, up to 97 percent of DDT, and up to 96 percent of the benzo(a)pyrene entering the Great Lakes waters.

Much of this atmospheric contribution is believed to result from long-range transport to the region from great distances—another key point. The best example of this is Siskiwit Lake on Isle Royale. In the northern reaches of Lake Superior is an island with a lake that is elevated. There are no direct discharges to it. Water from Lake Superior doesn't seep into it. Yet, in that lake we measure levels of toxaphene, which is a pesticide used primarily in the south on cotton. So we're dealing here with long-range transport of air toxics, also.

Data suggests that normal weather patterns bring pollutants to the Great Lakes from as far away as Mexico and Central America.

Certain toxic compounds are of particular concern in aquatic ecosystems because they are persistent. They do not break down in the environment. They are only slightly soluble in water, but very soluble in lipid fat cells, and therefore they bioconcentrate. Compounds that bioconcentrate accumulate in the fat cells of fish and may reach concentrations that are thousands of times the level in the surrounding water.

Also, accumulation can occur through the food chain. Micro-organisms absorb the pollutants. The little critters eat the micro-organisms. The little fish eat the critters. The big fish eat the little fish. And on and on the chain goes until the humans eat the fish. This bio-accumulation in aquatic systems of toxic substances deposited from air creates new avenues of human exposure.

We've been talking about risk this morning. This is one that has to be considered and isn't adequately taken into account when people do their risk assessment.

Nearly three million people fish in the great lakes, and most anglers eat their catch. In addition to direct inhalation, consumption of fish and contact with contaminated water and sediments are significant vectors of human exposure to toxic compounds from air pollution. To break this chain, there are a few chemicals which need special attention in the Clean Air Act amendment.

The IJC has recognized this problem and has concluded, "atmospheric transport and deposition into the Great Lakes Basin, either directly onto the water surface or indirectly into the drainage basin with subsequent transport, has been clearly demonstrated."

As I mentioned before, these concerns are not exclusive to the Great Lakes, nor are they limited to large lakes. The toxic substances threatening the Great Lakes are evident throughout the United States. Several individual States have also identified pollut-

ants in inland lakes, as I mentioned, at levels of concern warranting fish consumption advisories.

Atmospheric input and the resulting bio-accumulation in aquatic systems, adds a dimension to the air pollution problem that cannot be ignored. While we acknowledge and applaud the control technology approach incorporated in S. 816, we strongly urge that the Clean Air Act address the following points:

First of all, special source site cut-offs have to be established for the critical pollutants. Sources emitting much less than ten tons per year of IJC critical pollutants must be controlled. Evaluations for maximum achievable control ~~should~~ be required for considerably smaller emissions sources than ~~the~~ inhalation was the only route of exposure of concern for humans. For example, when considering dioxins and furans, an appropriate emission level should be in fractions of a pound per year, not tons per year.

An appropriate source site cut-off would result in a review of, for example, hazardous waste incinerators, sewage sludge incinerators, and municipal waste incinerators, but would not include source categories such as residential and commercial combustion sources. But to include those that I suggested should be included, you can't use a ten ton cutoff. It has to be much smaller than that.

Secondly, critical pollutants should receive priority for standard setting and compliance schedules. The seven that we're talking about are: alkylated lead, benzo(a)pyrene (BAP), mercury, hexachlorobenzene, PCBs, dioxins, and furans. These source categories should be included in the initial group of categories listed for evaluation for emission standard development.

Thirdly, evaluation of residual risks should incorporate indirect routes of exposure on an accelerated schedule. As I have discussed, indirect routes of exposure such as fish consumption are of concern for human health protection.

After the application of emission control, the evaluation of the remaining risk should incorporate both direct and indirect routes of exposure to determine if further reductions are necessary.

In closing, the Great Lakes Environmental Administrators are encouraged by the serious attention that air toxic compounds have received in recent months and in S. 816. We urge you to integrate the effects of bioaccumulation in aquatic systems in control strategies within this legislation. It is a critical, yet too easily neglected, dimension of the problem affecting fragile ecosystems and the health of millions of people who live near or visit and enjoy the Great Lakes.

Thank you.

Senator BAUCUS. Thank you very much, Mr. Miller.

Next we will hear from Mr. David Doniger.

STATEMENT OF DAVID DONIGER, SENIOR ATTORNEY, NATURAL RESOURCES DEFENSE COUNCIL, REPRESENTING THE NATIONAL CLEAN AIR COALITION

Mr. DONIGER. Thank you, Mr. Chairman.

I am pleased to testify on behalf of the 30 member organizations of the National Clean Air Coalition on the legislative proposals put forward to curb toxic air pollution.

A toxic cloud is hanging over America, and it is time to stop treating the atmosphere as the largest hazardous waste dump of them all. The fact is that people get their greatest toxic chemical exposure through the air—more than from dumps, polluted drinking water, or contaminated food. You drink two liters of water every day, but you breathe 15,000 to 20,000 liters of air per day. And you have some choice over the water you drink, but none over the air you breath.

Mr. Chairman, everyone who has put forward a legislative proposal, including President Bush, agrees that toxic air pollution is a major public health hazard. There is broad agreement that existing law needs to be strengthened. This committee can take great pride in the fact that its efforts on air toxics, beginning in the last Congress, provided the structure that all the other bills are starting with.

There are, however, great differences in the scope and strength of the legislative proposals. The administration's bill is the most deficient. Except for a token board with insignificant powers and no independence, the Administration bill ignores prevention of accidents. It ignores airborne toxics into the Great Lakes. It contains no provisions for toxic emissions from motor vehicles. And it deals only in the barest and most discretionary way with smaller sources.

Even with major sources, health protection would be fatally compromised.

Unfortunately, S. 816 also has some significant flaws. While it addresses areas the Administration bill ignores, and thus offers the necessary structure to work from, the Clean Air Coalition believes the bill does not, in its present form, provide adequate and timely protection for public health and the environment. The Coalition wants to work with the committee to make improvements in four areas. We urge the committee, when considering how to address these problems, to closely examine H.R. 2585, introduced by the late Mickey Leland and Guy Molinari. While that bill is not without need of improvement, its key provisions meet some of the shortcomings we have identified in S. 816, as well as S. 1490.

Let me turn to these four areas. The time tables in S. 816 need to be accelerated. People should not have to wait 5 to 13 years for compliance with the phase one standards, or 10 to 23 years to reach just the one-in-ten-thousand risk level in the second phase.

One specific suggestion we'd make is that we don't see the logic in giving EPA five years after the technology standards are set to issue the risk-based standards. These steps can and should be taken simultaneously with the technology standards.

EPA's August decisions on benzene tell us something very important about the appropriate time tables. Despite exaggerated worries last year, EPA found that there would not be any dire economic impacts from meeting standards approaching a one-in-ten-thousand risk in just two years under current law. In fact, the standards are not even expensive enough to trigger OMB review under the executive orders. This strongly supports a much more ambitious time frame for reaching the one-in-ten-thousand mark. If one-in-ten-thousand is feasible within two years, then surely the deadlines in S. 816 can be shortened.

In addition, if one-in-ten-thousand is attainable in the short run, then there is no reason why the more protective standard of one-in-one-million can't be given a definite time deadline with appropriate lead time.

The second area in which we urge improvements is the technology standards. These standards need a true floor, a minimum performance level linked to the best controls already operating.

Different people's idea of what is "best available technology" differ a great deal. For example, EPA's definition of BAT for coke ovens is explicitly based on the 95 percent confidence limit for the worst performing coke battery with this technology. It achieves only a 37-percent reduction in coke oven emissions.

S. 816 doesn't include such a floor. It ordains a top-down procedure which, with respect to the drafters' good intentions, will not work. We'd like to work with you on this.

The bill should include an objective of eliminating cancer-causing emissions. Monsanto and Union Carbide have already adopted goals of zero emissions—Union Carbide for carcinogens and Monsanto for all section 313 air pollutants. There is no reason why the law shouldn't have a similar objective.

Finally, we believe you need to make the "urban soup" provisions more specific. Without specifics, experience shows that little will be accomplished by EPA. As written, the area source program allows EPA too much discretion and is likely to turn into a purely planning exercise. We urge you to add the measures for motor vehicle air toxics and for standards for categories of area source air toxics that are found in H.R. 2585.

On the subject of accidents, I defer to the testimony of my colleague from the National Wildlife Federation.

We would like to work with the committee on improvements to this bill, and we commend you for your efforts and would like to move ahead with you.

Thank you.

Senator BAUCUS. Thank you, Mr. Doniger.

Next we will hear from Dr. John Graham. Welcome.

STATEMENT OF DR. JOHN GRAHAM, DEPARTMENT OF HEALTH POLICY AND MANAGEMENT, HARVARD SCHOOL OF PUBLIC HEALTH

Dr. GRAHAM. Thank you very much.

I do have copies of this testimony that I'd like to be distributed.

Senator BAUCUS. Yes. Your written testimony will be included in the record.

Dr. GRAHAM. Thank you.

I'd like to focus my discussion on what I think of as the second phase of air toxics control, which is after the best technology provisions, which I hope can receive wide consensus, are adopted. Then we need to put into place a system for looking at the residual emissions, and I'd like to focus my remarks on that second phase of the legislation.

Let me begin by saying that the theme of my remarks is that Congress needs to put some heat on the EPA to do a better job of incorporating science into the upcoming evaluation of these residu-

al risks. While the dimensions of the problem of air toxics may seem ominous, it is important to keep the science in this area in some kind of perspective.

First, while there is a logical basis for public health concern, there is no direct evidence that outdoor exposures to toxic air pollutants are responsible for a significant fraction of disease or mortality. In the case of outdoor exposures, health concerns are inferred from either long-term animal studies or epidemiological studies of highly exposed workers. The levels of toxics that people breathe in daily life are typically several factors of ten smaller than the levels that have been studied by scientists. Nonetheless, the available studies are a hint of a potential problem and provide a sound basis for public health concern.

Second, despite the lack of direct evidence, EPA risk assessments suggest that inhalation of air toxics may increase the incidence of disease—especially cancer—among highly-exposed populations. In a recent report to the Congressional Research Service—which I'd like to submit for the record—a research team at the Harvard School of Public Health examined the scientific basis of EPA's risk assessment process. We found that although EPA has developed a cancer risk assessment procedure, the agency has not yet developed a parallel procedure for other health effects such as neurotoxicity and reproductive effects. We'd urge you to encourage them to do so.

On the other hand, EPA's widely quoted cancer risk estimates should be treated with caution, because they are based on some questionable assumptions—for example, that humans are as sensitive as the most sensitive tested animal species, and that any human exposure to a carcinogen, no matter how small, results in some increase in cancer risk.

While these are prudent assumptions to make in the absence of sound data, EPA has not always been responsive about revising its assumptions in light of scientific advances. For example, EPA's recent decision on benzene and its ongoing risk estimates for formaldehyde, gasoline vapor, and perchloroethylene are scientifically outdated. They need to be revised before we come back to those residual risk questions five to seven years down the road.

After reading our report to Congress, EPA administrator William Reilly wrote to Congress on August 10th. I'd like to submit his letter as part of the record, if I can. Mr. Reilly committed himself to improving the agency's risk assessment process. I'd like this committee to hold him to that commitment and to write in some language that calls for increased use of science in risk assessment.

Third, there are people who live very close to industrial sources of toxic air pollutants—for example, coke ovens—which may experience substantial elevations in lifetime cancer risk, say in the range of one in one hundred to one in one thousand. While I am convinced that such hot spots are a potentially serious problem, we should keep in mind that the EPA's risk estimates to the so-called maximally exposed individual (MEI) are, in fact, hypothetical. They assume, for instance, that people live outdoors of the fence line of a major source for 70 years, 24 hours a day. And, more often than not, the risk estimates to the MEI are based on predicted or modeled exposures rather than actual personal exposure or station monitor readings.

EPA risk assessors are aware of this problem, and they know they need to develop a more realistic procedure for calculating risks to the maximally exposed individual. I think a little encouragement from this committee would be in order, as well.

Let me conclude with three guidelines that I'd like to see in our legislative package on air toxics. One, I hope we can get broad consensus on a fairly quick—as David Doniger said—technology-based approach, phase one.

Second, Congress should direct EPA to use the best available science when assessing the residual risks of air toxics in which this residual pollution, after technology, is mandated. In particular, Congress should order EPA to review its risk assessment guidelines within two years and revise its risk estimates for selected pollutants in light of new scientific knowledge. There are already some provisions for risk assessment in Senate bill 816, but they need to be refined and they need to be made more specific. We also need deadlines and hammers to assure that EPA will use better science in these residual risk assessments. I think that this tough language would strengthen the hands of those EPA officials who want to upgrade the agency's reputation and scientific credibility.

Finally, Congress should resist the temptation to establish these arbitrary risk cutoffs such as one in ten thousand or one in one million for the regulation of residual risks. While quantitative risk assessment has improved in the last decade—and I make a living trying to peddle it—it is still a very inexact science. It would be foolish to pretend that scientists know whether the cancer risks posed by a particular source exceeds or falls short of some precise risk number. Indeed, Congress should instruct EPA to inform the public of the uncertainties in risk assessment as they arise on a case-by-case basis. Rather than insist on compliance with these inflexible risk cutoffs, Congress should instruct EPA to strive for a balance, as it inevitably will have to do so, between health, economic, and technological considerations.

If the purpose of these so-called bright lines is to put pressure on industry to reduce residual emission, I would like to recommend an alternative strategy for achieving that goal. Congress should compel EPA to publish each year a list of specific plants and companies that pose significant residual risks either to maximally exposed individuals or to the population, as a whole. In light of the public's growing interest in environmental quality, I am confident that this embarrassment factor will be experienced in the board rooms of corporate America, and it will create incentives to reduce these residual emissions. The effectiveness of this strategy will be enhanced when EPA's risk assessment process earns a greater degree of credibility within the scientific community.

Thank you very much for your time. I would like to submit both our report to CRS and the letter from Administrator Reilly for the record.³

Senator BAUCUS. Thank you very much, Doctor Graham. That was very interesting.

³ The material referred to has been retained in committee files.

Next we will hear from Mr. Walter Williams, who is Chairman and Chief Executive Officer of Bethlehem Steel.

STATEMENT OF WALTER WILLIAMS, CHAIRMAN AND CHIEF EXECUTIVE OFFICER, BETHLEHEM STEEL, REPRESENTING THE AMERICAN IRON AND STEEL INSTITUTE, ACCOMPANIED BY DAVID M. ANDERSON, GENERAL MANAGER, ENVIRONMENTAL AFFAIRS, BETHLEHEM STEEL CORP.

Mr. WILLIAMS. Good morning, Mr. Chairman, and members of the committee.

I am also testifying today on behalf of the American Iron and Steel Institute, referred to as the AISI. AISI is the principal trade association of the iron and steel industry, and its members account for about 80 percent of the nation's steel production.

I am accompanied today by Doctor David M. Anderson, who is General Manager for Environmental Affairs of our company, and also chairman of the Subcommittee on the Clean Air Act with AISI.

I have a written statement which has been submitted for the record, and I will briefly summarize that paper.

The U.S. steel industry has been committed to the implementation of the Clean Air Act and has already spent billions—over \$4 billion—for air pollution controls—much of it for controls on coke oven emissions.

The industry is also supportive of the proposal to control toxic air pollutants through the application of maximum achievable control technology, or MACT, as contained in the Administration's bill.

If further control steps are warranted for dealing with residual risks associated with the sources of toxic air pollutants after implementation of MACT, AISI supports the approach of Senate bill 1490, which takes into account the cost and the availability of technology in establishing the level of unreasonable risk.

In particular, we are concerned about coke oven emissions. Air pollution controls on existing coke oven batteries have reduced emissions over a period of years by over 90 percent; however, we appear to be reaching the limits of what can be done to control emissions from these inherently difficult to control sources. We must keep in mind that the coke making process consists of driving volatile organic compounds out of coal under positive pressure in a refractory structure. And coke ovens are almost certain to leak—even new ones—at some time during their life cycle.

EPA estimates that even with the implementation of an aggressive interpretation of MACT, which could cost the industry as much as \$5 billion, the remaining maximum individual risks—maximum—from coke oven emissions is still likely to be greater than one in one thousand.

To go beyond the MACT level to a risk level of one in ten thousand would require the shut down of 36 to 39 of the 40 coke oven plants, as evaluated by EPA, themselves. A one in one million risk level would, according to EPA's estimates, result in the shut down of all coke production facilities in this country.

And, in fact, lack of significantly higher levels of technology would probably preclude the construction of any new coke oven batteries to meet that level in the foreseeable future.

The consequences of closing all or a large fraction of domestic coke ovens would be severe—in fact, catastrophic. The integrated steel industry, the predominant supplier of steel in the United States, is totally dependent on the availability of coke, and foreign coke is unlikely to be able to meet this demand. To the extent imported coke were made available, this would make the steel industry a hostage to foreign sources of coke—primarily from other steel producers around the world—and would, in effect, export pollution to other countries.

AISI, in cooperation with the Department of Energy, has undertaken a project to develop a continuous process for making steel that eliminates the need for coke, but its success is uncertain and, even if successful, the replacement of existing high capital intensive steel-making facilities now in place with such new technology would require tens of billions of dollars and several decades to accomplish.

The steel industry supports title three of Senate bill 1490 and, in particular, urges retention of the unreasonable risk approach for dealing with any residual risk after MACT. This approach will permit consideration of the benefits of maintaining an integrated steel industry in our country and the total social cost of regulation. In addition, it would allow an evaluation of other health factors, such as the total exposure and incidence of cancer, the weight of the evidence of health risks, compliance costs, and, finally—and perhaps most important—the availability of technology.

Considerable time and resources will be needed for the research and development of process and emission control technology to create the dramatic breakthrough that would be necessary to achieve the residual risk levels specified in Senate bill 816.

The steel industry is committing sizeable resources to new technology such as direct steel making and improved emission control systems toward the goal of attaining a realistic, reasonable maximum individual risk level, and they will continue to do so in seeking new breakthroughs in emission reductions. But let me tell you that technology is not invented overnight; it evolves over time.

At the same time, we, agreeing with Doctor Graham, believe more scientific data is needed on risk evaluation, and the risk assessment methodologies should be improved and implemented before making the final decisions on residual risk-based emission standards.

Thank you for the opportunity to testify.

Senator LAUTENBERG. Thank you very much, Mr. Williams.

The chairman has left for a few minutes, and therefore what I'll try to do, in fairness to the process and the sequence of questioning, I'll handle it as if Chairman Baucus were here and ask Senator Chafee if he would ask his questions now.

Senator CHAFEE. Thank you, Senator.

Mr. Williams, what are your competitors doing? Why don't we start down the list. Let's take probably the most high technology presumably, Japan, and then go to West Germany, U.K., and

Brazil and those countries that are at the other end of the spectrum. What is Japan doing, for example, on the coke situation?

Mr. WILLIAMS. I believe that in most of the developed nations of the world—the Europeans, Japanese, Canadians—have been following, in a sense, the same path we have up to today's time in developing the maximum controls they can on coke oven batteries and on all steel-making processes. So they are not too far behind. It varies by country. Some countries are a little more tolerant than the United States and the Japanese, perhaps.

I think our concern is: what do we do in the future? And will the rest of the world put such stringent restrictions on in years out? And I get back to my concern not for applying the maximum available or achievable technology now, but trying to set standards now where we really don't know much about what technology is going to be required or what the risk will be in the future.

And so I have no idea what they will be looking at as they look ahead, but I would say most of the developed nations are probably as stringent and as good as we are right now.

Senator CHAFEE. Just out of curiosity, you said that 39 of the 40 plants wouldn't qualify—obviously, one does—at the one to ten thousand risk. What is unique about that particular plant?

Mr. WILLIAMS. It might be—in fact, I'm not aware of which plant that is. If I knew that, I could answer better. But I would assume it is probably the newest battery built in the United States and, therefore, it would be a very tight oven and very closely controlled.

The problem is that these ovens age. Things happen. Doors warp. It is hard to maintain the door seals—and we have spent hundreds of millions of dollars trying to do that. So I would assume it is a new battery, but I don't know. I will look that up for you, Senator.

Senator CHAFEE. Yes, I would be interested in that.

[The following was supplied for the record:]

We have not been able to identify the battery in question. Since this information came directly from an EPA publication (July 28, 1988 FEDERAL REGISTER Vol. 53, No. 145, page 28531) we suggest that they be contacted directly for this information.

Senator CHAFEE. Doctor Graham, I listened to you carefully, and you said EPA's system for risk assessment was flawed and gave us lots of examples. But I'm not sure what your conclusion was. Could you repeat your conclusion?

Dr. GRAHAM. Yes. I'd like the committee, if possible, to add some language to the air toxics legislation that would encourage EPA to revise its risk assessment guidelines based upon scientific information that has been published since the last time the risk estimates for these pollutants were made.

Are you asking about my broader views about the air toxics bill, itself, or—

Senator CHAFEE. No, no. You dealt primarily with the risk assessment in your statement, and you showed how inaccurate the existing one was. To me, it appears to be a very, very inexact—to grace it with the term "science" perhaps is going too far. It is a risky business to try and come up with specifics. Do you agree with that?

Dr. GRAHAM. Yes. But, in fairness to EPA, I think they're in a situation where, because of judicial constraints, they have to make

risk estimates in order to make regulatory decisions. So when they don't have data, they try to make what are prudent public health assumptions, and I think they should continue to do that. But what I would like to encourage—

Senator CHAFEE. They've got to, pursuant to the language we've got in the bill for the second stage. But you don't think they're doing it very well?

Dr. GRAHAM. I don't think so far they're doing a very good job of bringing additional science into their risk assessment when they can replace the prudent assumptions they otherwise need to make.

Senator CHAFEE. What do you say about that, Mr. Doniger?

Mr. DONIGER. Well, I think that this is a constant theme of disagreement. There are debates about each of these risk estimates, and when some people don't get them revised the way they want, they argue that the result is not "good science." Regarding one of the examples that Doctor Graham mentioned—benzene—EPA has just completed a thorough review of the benzene risk estimate and decided that its estimate is better than the one being urged on the Agency by consultants to the oil industry. These kinds of debates will continue.

You have a provision in your bill that directs EPA to review and update the risk assessment methodology periodically. That happens anyway, and it is a good thing. So I support that provision. But I don't agree that there is a massive, consistent overstatement of the risk estimates.

Senator CHAFEE. Several have complained about using the animal-based system. What else are you going to use?

Mr. DONIGER. You have no choice but to use data from workers who, unfortunately, have been exposed in the past, and from animals. The only choice is to run a big experiment on all of us—which is what we're really doing now—or just to remain ignorant. Thus we must work from the assumptions based on animal studies.

Senator CHAFEE. Thank you.

Thank you, Mr. Chairman.

Senator LAUTENBERG. I didn't mean to cut you short, Senator Chafee. If you have another question—

Senator CHAFEE. No. That's it. Thank you.

Senator LAUTENBERG. Doctor Graham, I wonder if you could just help me out with a little bit of some biographical information. What exactly is your position on the faculty at Harvard? Do you want to just describe it for me?

Dr. GRAHAM. Yes. I'm an associate professor in the Department of Health Policy and Management at the Harvard School of Public Health.

Senator LAUTENBERG. Do you do a lot of outside consulting?

Dr. GRAHAM. No. I wish I could do more.

Senator LAUTENBERG. Do you do any?

Dr. GRAHAM. I have done some. Absolutely.

Senator LAUTENBERG. Who do you usually consult for?

Dr. GRAHAM. Let me recollect on that. I've consulted for the Congressional Research Service. I've consulted for the Motor Vehicle Manufacturers Association. I've consulted for the National Academy of Sciences. I can supply you with a more complete list.

Senator LAUTENBERG. Do you work with any industry groups at all? Most of these agencies or organizations that you mentioned are non-business types.

Dr. GRAHAM. Well, MVMA certainly is—Motor Vehicle Manufacturers Association.

Senator LAUTENBERG. I'm sorry. I missed that.

Dr. GRAHAM. I'd like to think I work with government groups and with the industry groups and I recently participated in a project that David Doniger was involved in that included environmentalists, business, and government. While we couldn't agree on everything, we certainly tried to work together.

[Dr. Graham supplied the following biographical information:]

BIOGRAPHICAL INFORMATION AND A LIST OF CONSULTING AND RESEARCH ARRANGEMENTS

John D. Graham was awarded his B.A. from Wake Forest University, his M.A. from Duke University, and his Ph.D. in public policy from Carnegie-Mellon University. Before joining the Harvard faculty, Dr. Graham performed post-doctoral research on cancer risk assessment at the Harvard School of Public Health. Dr. Graham's other professional affiliations include senior staff associate to the Committee on Risk and Decision Making of the National Research Council (1979-1981), visiting scholar on regulation at the Brookings Institution (1982-1983), and visiting fellow at Resources for the Future (1989 to the present). Dr. Graham teaches classes at Harvard in decision analysis, environmental risk analysis, policy analysis and injury control.

Dr. Graham's principal research interests are environmental health and highway safety. He is a co-author (with Laura Green and Marc J. Roberts) of "In Search of Safety: Chemicals and Cancer Risk" (Harvard University Press, Cambridge, MA, 1988) and the author of "Auto Safety: Assessing America's Performance" (Auburn House Publishing Company, Dover, MA, 1989). Dr. Graham has published over thirty papers on risk analysis and management and is a member of the editorial boards of the international journals *Risk Analysis* and *Accident Analysis And Prevention*. Dr. Graham has served on several committees of the National Academy of Sciences and is a member of both the American Association for the Advancement of Science and the Society for Risk Analysis.

Since 1980 Dr. Graham has served as a consultant to numerous public and private sector organizations. The specific sources of consulting income include the Brookings Institution, the Congressional Research Service, the Environmental Protection Agency, the Health Effects Institute, the Institute of Medicine, the Motor Vehicle Manufacturers Association, the National Research Council, Resources for the Future, and Texaco.

Since coming to Harvard in 1985, Dr. Graham has also been awarded numerous research grants to study various topics in risk analysis and management. The specific sources of research funding include the Alfred P. Sloan Foundation, the American Industrial Health Council, the Andrew Mellon Foundation, the Centers for Disease Control, the Dow Chemical Company, the Environmental Protection Agency, the Motor Vehicle Manufacturers Association, the National Association of Wheat Growers Foundation, the National Highway Traffic Safety Administration, and the Risk Science Institute.

Dr. Graham's interests in the air toxics issue began in 1985 when he published an article in the *Duke Law Journal* recommending legislative reform of Section 112 of the Clean Air Act Amendments of 1970. The article advocated (1) a "low-hurdle" process for listing hazardous air pollutants, (2) a "significant-risk" test for determining which industrial source categories should be regulated, (3) a presumptive "technology-based" test for setting emission standards, and (4) an "unreasonable-risk" test for regulating residual emissions of hazardous air pollutants. A copy of the *Duke Law Journal* article is attached to these remarks. Funding for this research was provided by the U.S. Environmental Protection Agency in the form of post-doctoral fellowship support.

In 1988 Dr. Graham was commissioned by the Congressional Research Service (CRS) to assess the potential health benefits of Title V of the Mitchell bill (S. 1894 in the 100th Congress). A copy of that report is attached to these remarks. The findings of this study were presented to over 75 congressional staff members at a De-

ember 1988 seminar sponsored by the CRS. The report to CRS was also the basis of Professor Graham's recent remarks to a CRS-sponsored breakfast for members of Congress, a follow-up CRS panel discussion for congressional staff, and public testimony before this subcommittee of the U.S. Senate.

Senator LAUTENBERG. If we don't establish some benchmark for determining residual risks, Mr. Doniger, won't we be giving EPA unlimited discretion to determine what the residual risk level should be?

Mr. DONIGER. I think that's right. I think one has to distinguish between the use of a risk number as the law's goal—the "finish line," if you will—and the methodology for calculating the risk in specific instances. It is perfectly appropriate—and I think it is necessary—that Congress say what is the maximum tolerated level of cancer risk from the point of view of what is the law's objective. What is the mark you're shooting at? It is up to EPA, in the bi-play with scientists and industry and environmentalists, to make the best conservative estimates of what the risk number is for a specific chemical and type of industry. But it is perfectly appropriate for Congress to draw the line in the dirt and say this is the measure of what is acceptable for people's health.

Now, with respect to pesticides on food, EPA has said the acceptable risk is not higher than one chance in one million I don't understand why pesticides on food should be safer for us to eat than chemicals in the air we must breathe. Why shouldn't we have the same level of protection to one in one million for the chemicals in the air, too?

Senator LAUTENBERG. Mr. Williams, in your testimony you talked about the fact that if we have to bring imported coke in, that, in fact, we wind up exporting pollution abroad. Do you want to just clarify that for me, please?

Mr. WILLIAMS. To this extent, Senator, I believe—and I'm not so sure it is possible to do that, but if it were possible I think there would be certain areas in the world that we—

Senator LAUTENBERG. Are you talking about coke, itself, or are you talking about the ovens?

Mr. WILLIAMS. No, no. I'm talking about the material, bringing coke in, by having some foreign country that has an adequate control of coal somewhere putting coke ovens in with nowhere near the regulations or the restrictions we have on pollution and producing coke there and then shipping that coke to other States. You still have these same—

Senator LAUTENBERG. So coking it first, and—

Mr. WILLIAMS. Absolutely. Coking it there. This does not contribute to reducing pollution worldwide. And that could happen because a lot of them aren't up to our standards.

Mr. DONIGER. Mr. Lautenberg, may I comment on that?

Senator LAUTENBERG. Sure.

Mr. DONIGER. Mr. Williams mentioned the direct steel-making process. There was an article in the New York Times this summer—which I will supply for the record⁴—which indicates that the economic and environmental issues are converging here. This new process is going to be the only competitive way to make

⁴ See p. 198.

steel, and it doesn't involve coking at all. It is the way to completely eliminate the coke oven.

The \$30 million that the steel industry and the Department of Energy are spending over the next few years pales in comparison to what the Japanese and the Europeans are reported to be spending. We run the risk, again, of having an uncompetitive steel industry. And it will be a polluting steel industry, as well. So I think the development and deployment of the direct steelmaking process has to be really accelerated.

Senator LAUTENBERG. Thank you. Any comments, Mr. Williams?

Mr. WILLIAMS. I don't agree with that position. We will be competitive, and we can buy technology, and we are developing—they are no further ahead in this process than we are at this point in time, in spite of the additional money they have spent.

Senator LAUTENBERG. I'd like us to be able to continue. Unfortunately, the rules apply to the acting chairman as well as the other members of this subcommittee, so we'll next ask Senator Breaux for his questions.

Senator BREAU. Thank you very much, Mr. Acting Chairman. I appreciate that.

Senator Lautenberg and I were talking about our various impressions of the Harvard School of Public Health prior to your testimony, Doctor Graham, and then immediately following your testimony we reassessed our impressions.

We didn't say which way.

You really get to the heart of the problem, whether we agree with your conclusions or not, and that is the question of how we determine, after the best available control technology is required for all the sources, how we assess at that point whether that is enough or not. And that's really the nut of the coconut and what we're looking at. Is this enough, or isn't it? If it is not enough, do you shut down the source or do you do something else to make it sufficient?

The reason why I think this committee has such a grave concern about making sure it is done properly is because under section 112 of current law the Administration has, in the last 18 years of their effort, listed only 8 pollutants. That record is not very good. That system is not working.

I guess what we're wrestling with is how we do it. I am very uncomfortable—as I take it perhaps you are—with the numerical assessment that the bill requires. I just don't think it is going to work. I think it is going to be litigated until hell freezes over. We're going to have the same problem 18 years from now because we will still be saying does this meet the ten to the six; no, it only meets ten to the 4.4. It's not going to work, in my opinion. We're going to be in the same place.

I take it that your suggestion is that we should replace this with a new system. Elaborate on what we're talking about. How do we ensure that they do a good job with what you perhaps are suggesting?

Dr. GRAHAM. What I'm suggesting is that we have, in the second stage, the unreasonable risk test, which is, I believe, in the President's proposal. But I'm also suggesting something to supplement the unreasonable risk test.

The problem I see with the unreasonable risk test, as Senator Lautenberg mentioned, is that it gives a lot of discretion to EPA to make a call on what is going to be unreasonable risk. There needs to be some incentive in the process for industry to invest in research and development to reduce those residual emissions. What I would like to do is have a process where it is very clearly identified which plants and which companies are responsible for emissions that exceed certain levels of risk, and I think that there has already been progress made in releasing that kind of information in the last couple of years, and I think it can have a lot of impact in creating a public consensus around the need to reduce these residual emissions.

Senator BREAUX. The real question is: How do we determine what the standard should be before penalties are assessed?

Senator BAUCUS. I think you need more than incentives. You need penalties.

Senator BREAUX. I support that. If they don't meet the standard, there should be a penalty for it. That's the greatest incentive that they can possibly have.

The problem is: What is the standard? How safe is safe? How clean is clean? How healthy is healthy? I just am very concerned—and apparently you and others are, too—that ten to the minus six or to the minus four is not going to work.

I'm not sure if we have an answer to that. I'm just really at a loss on what to do.

Does anybody else have any comments on that?

Mr. DONIGER. I think it is very important for Congress to set what the goals are. Then the debate over the risk estimates—whether they are or are not accurate—can take place against a bench mark of a consensus and decision made by the Congress as to what you are really trying to get to.

At this point there is not that much incentive to really figure out whether these risk numbers should be changed up or down because they don't play any specific, tangible role in the decision making.

If there were a clear bench mark, then every industry would have many years, starting even before the technology standards are set, to get all the data it wants about exposure, dose-response, and every other aspect. Then you'll get the best case made on the science and come up with a number that you use and live with until there is a better scientific basis for changing it.

Senator BREAUX. Aren't you recommending that that be done at the same time that MACT be put in place?

Mr. DONIGER. That's right.

Senator BREAUX. That doesn't give them a lot of time.

Mr. DONIGER. That gives them 2 to 10 years under the bill. Two years for the first group, for which all these risk estimates have already been done, and ten years for the group of sources on which the homework hasn't been done yet.

Senator BREAUX. With something that is so specific as ten to the minus six, do you now fear that we will have the same litigation problems and the complications and the drawn out periods of whether this meets this standard or not?

Mr. DONIGER. Senator Breaux, unfortunately, I am confident we're going to have litigation no matter what rules are—

Senator BREAUX. There is no question about that, but it is going to be easier to litigate and tie something up if it is so specific as ten to the minus six has to be proven in a court of law as opposed to something that is more generic that just cleans up the area.

Mr. DONIGER. I agree that there should be a technology-based first step. Of course, we all agree on that now, it seems, and that's great progress. As to the residual risk issue, anybody who thinks they can win a case like you describe in today's courts with all the deference they express to agency expertise, is nuts. So these cases are brought—if they are brought at all—only to delay things, and that's a phenomenon you can't avoid in the system we've got. I wish we could.

Senator BREAUX. Thank you.

Mr. MILLER. Senator, may I follow up on that?

Senator LAUTENBERG. Quickly, Mr. Miller.

Mr. MILLER. There is an assumption that is so often made that these risks are so conservative and way overestimated, and that isn't always the case. I would call your attention to a study that was sponsored by the State of Minnesota where they asked the experts in this research to not make any conservative assumptions, but just make the most accurate assumptions they could about the risk from an incinerator that was being proposed—a municipal incinerator—and look at all of the avenues of exposure, like the one that I have mentioned, the bioaccumulation to the fish. And, without any conservative assumptions at all, they found that avenues of exposure other than inhalation, which is usually what is being looked at in a lot of these studies, far outshadowed orders of magnitude greater risk—way under-estimation by the traditional techniques of what the real risk was.

Senator LAUTENBERG. Are you suggesting, therefore, that we focus less on the air toxic emissions?

Mr. MILLER. What it really does is show the wisdom in what you are doing by taking a technology approach and doing that first and then leaving these kinds of arguments to the end. Let's take a look at the compounds and let's start controlling the major sources.

Of course, what I'm saying is to start controlling some smaller emission level sources or start applying your MACT to some smaller sources because of the fact that they contribute to these other avenues of exposure.

Senator LAUTENBERG. Thank you very much.

Senator Lieberman.

Senator LIEBERMAN. Thank you, Mr. Chairman.

Dr. Graham, we've been talking with you about your criticisms of the health assessment risk standards of EPA with regard to cancer, and your criticism that they may be overstated. I'm familiar with the report that you submitted and that you did for the Congressional Research Service, and in that you were critical of EPA from another point of view, which was that they did not adequately—correct me if I am wrong in stating this—take into consideration the non-cancer effects of air toxics—the effects on our immune systems, on reproductive systems, neurological effects, kidney effects. Would you talk a little about that and relate it to the committee's bill and the Administration bill, as you understand both of the proposed legislation.

Dr. GRAHAM. Let me first say that I didn't intend to convey the impression, if I did, that I think that the EPA cancer risk assessments are always overstated. In fact, in my full testimony I cite some work by Dr. Adam Finkel, of Resources for the Future, who has looked at the effect of bringing new science into risk assessment. Sometimes it increases the risk estimates; sometimes it reduces the risk estimates. The point is to make them more accurate, not to make them higher or lower, and that's why I'm advocating the use of science in EPA's process.

Now, Mary Jean Sawey, a colleague of mine and a post-doctoral fellow from the Harvard School of Public Health, has made the point that she feels that EPA is putting a lot of energy and resources into making these cancer risk estimates when, in fact, the toxicological information on other end points such as neurotoxicity and reproductive effects, is of sufficient concern that some energy and resources at EPA should be put into generating some risk estimates in those areas. And it is something that I think the committee could encourage with some report language, or whatever. We need a risk assessment process based on science for some end points other than cancer.

I'm not opposed to these risk assessments. I'm in favor of them. I'd like to see more of them, and I'd like to see them be done better in terms of their scientific basis.

Senator LIEBERMAN. Are you familiar with what the Senate bill does in requiring a standard to be set for adverse health effects other than cancer?

Dr. GRAHAM. My recollection of it is that assumes sort of a no effect level with some kind of safety margin, but I haven't studied it in detail.

Senator LIEBERMAN. If I could, I'd invite you to take a look at that and the Administration bill with regard to this particular point of non-cancer effects of air toxics and, if you would, submit some written response to us as to how you judge it and recommendations you might have.

Dr. GRAHAM. Sure.

[The information requested follows:]

ADDITIONAL COMMENT ON THE "RESIDUAL" RISK PROVISIONS OF S. 816

After major sources have installed maximum achievable control technology, S. 816 calls for the adoption of additional health-based standards to reduce any residual emissions of hazardous air pollutants. Different health-based tests are required for carcinogenic and noncarcinogenic pollutants. For carcinogenic pollutants, lifetime risks of cancer to maximally exposed individuals must be reduced to one in a million (with an interim standard of one in ten thousand). The costs of control, cost-effectiveness, and technological feasibility may not be considered. For non-carcinogenic pollutants, standards must be set that protect the public health with an ample margin of safety. Again, economics and technology may not be considered.

In short, the health-based standards in S. 816 are unrealistic, unscientific, and misleading to the public. In fact, the residual risk provisions in S. 816 suffer from some of the same flaws that have plagued Section 112 of the Clean Air Act Amendments of 1970 for the last twenty years. Specific flaws are noted below.

The numerical tests for carcinogenic pollutants in S. 816 reflect a misunderstanding of risk assessment. The state of the art has not advanced enough to permit a determination about whether the risks from a source exceed or fall short of some arbitrary risk number. Moreover, much of the knowledge in the risk assessment process is qualitative or judgmental in nature (e.g., evaluating the quality of epidemiological data or toxicological judgment about the human relevance of animal

tumors) and could not be weighted under such a strictly quantitative approach. The legislated risk numbers would discourage EPA from telling the public the truth about the uncertainties in risk assessment.

The ample-margin-of-safety-test in S. 816 reflects a misunderstanding of recent scientific thinking about noncancer health effects such as reproductive dysfunction, neurotoxicity, immunotoxicity, and kidney damage. If scientists were confident that no-effect levels existed for noncancer health effects, then a margin-of-safety approach would be workable. However, it cannot be assumed that such effects occur only above some particular dose level, or that such effects are always acute in onset and reversible. Noncancer effects may result from the cumulative effect of exposure to the same pollutant or from the interaction of various chemical exposures. In the case of neurotoxic and reproductive effects, there is already some evidence to support a no-threshold model since even single exposures to particular pollutants may produce a response. Other factors, such as wide variations in human susceptibility to effects and opportunities for increasing the incidence or severity of pre-existing disorders, make it very difficult to establish credible thresholds or margins of safety. In the years ahead, the scientific community is likely to entertain various non-threshold models for predicting noncancer effects, even at relatively low exposure levels. S. 816 should be written to accommodate such scientific advances. (This paragraph is based on consultation with Dr. Mary Jean Sawey, now a faculty member at the University of Pennsylvania Medical School.)

For both cancer and noncancer endpoints, S. 816 orders EPA to set residual risk standards solely on the basis of health considerations, without regard to economic or engineering realities. Such attempts to censor practical considerations are unrealistic and misleading to the public. It was just this kind of censoring that contributed to the litigation and paralysis of decision making under Section 112. No responsible EPA Administrator would set a national emission standard without considering the implications for compliance and the economic well-being of the public. The attempt to censor engineering and economics will only result in expensive and time-consuming litigation. The statute should authorize the EPA Administrator to tell the public the truth about how public policy decisions are made when both public health and industrial productivity are at stake.

The residual risk provisions in S. 816 should be replaced by the "unreasonable risk" test that President Bush has proposed. Under this test, cancer and noncancer health effects could be considered in light of recent scientific advances. Likewise, the EPA Administrator would be "permitted" to consider engineering and economic realities. If the Congress is not satisfied with the way that the EPA Administrator makes unreasonable-risk determinations, it can use the oversight process and/or specific legislation to induce corrections.

The weakness of the unreasonable-risk test in President Bush's plan is that it does not create a strong incentive for industry to develop better ways to reduce residual emissions. To create stronger incentives, the following provisions should be added to the unreasonable-risk test. First, Congress should order EPA to publish an annual list of those specific plants (including geographical location and ownership) that generates significant residual risks. In light of the public's growing sensitivity to environmental quality, this list will create embarrassment in corporate board rooms throughout America. Second, EPA should not be permitted to authorize permits to plants with any residual emissions, unless those plants pay a per-pound fee on their emissions. The prospect of paying these fees will strengthen corporate commitments to emission control, and provide Senator Breaux the penalty for which he is looking. Note that the fees will also avoid the litigation that Senator Breaux predicts will plague the risk-based standards.

Since the control of residual emissions is likely to be difficult and expensive for many industries, Congress should order EPA to take steps to insure that the public attains some genuine health benefits from such investments. While it is reasonable to require MACT for major industrial sources on the basis of speculative risk assessments, the public has a right to expect that investments in control of residual emissions will have a stronger scientific basis.

During the period between application of MACT and consideration of residual emissions, EPA should make a concerted effort to update its risk estimates for hazardous air pollutants in light of new biomedical science and exposure information. Although EPA cannot do much better without more data, the Agency has not always been responsive about revising risk estimates when better data become available. For example, EPA has still not revised its risk estimates for formaldehyde and unleaded gasoline to reflect new information about pharmacokinetics and pharmacodynamics. The point of revising risk estimates based on science is not to make the numbers look bigger or smaller but rather to make the numbers more accurate. It is

encouraging that EPA has recently begun to consider new scientific information. Congress should reinforce this trend by ordering EPA to update both its risk assessment guidelines and its risk estimates for particular pollutants. Specific deadlines should be included in the legislation to discourage prolonged delays.

For noncancer health effects, EPA has been working to develop risk assessment guidelines. Some "default" positions (e.g., the so-called Risk Reference Dose) are now in use at EPA. The process has been slow, in part because the science is complicated and in part because the Agency tends to become preoccupied with issues in cancer risk assessment. Congress should encourage EPA's work on noncancer risk assessment by requiring a report to Congress on what is known about the noncancer health effects of air toxics and what the Agency has done to develop risk assessment guidelines for noncancer endpoints. The report should be updated every three to five years.

As EPA considers the scientific basis for regulating residual emissions of air toxics, it is important for the Agency to consult with the scientific community and make sure that data exists to support the Agency's regulatory ambitions. EPA's improved working relationship with its Science Advisory Board is an important step in this direction. However, EPA needs to do a better job of consulting with other scientific organizations with significant toxicological expertise. In particular, Congress should require EPA to consult regularly with the Health Effects Institute (HEI), the Institute for Evaluating Health Risks (IEHR), and the Chemical Industry Institute of Toxicology (CIIT) about what research on air toxics is in progress and how the scientific basis of EPA risk assessments can be improved. Some scientists at EPA are already beginning to build productive working relationships with scientists at these organizations.

If EPA does not consult effectively with credible scientific organizations in the private sector, then the process of regulating residual emissions is likely to be highly adversarial. By encouraging such coordination, Congress can pave the way for an effective EPA effort to control residual emissions. The Agency's Risk Assessment Forum might be an appropriate vehicle for promoting EPA consultation with scientific organizations in the private sector.

Senator LIEBERMAN. Mr. Doniger, I'm going now to the question of catastrophic accidents that involve air toxics. The committee bill puts this investigative board independent, separate; and the Administration bill has it as part of the EPA. How important is it that the board be independent?

Mr. DONIGER. I think it is critical that it be completely independent. In fact, I would urge you to make it more independent than the committee's legislation than it is in S. 816.

The Administration bill illustrates the problem. Under that bill, the members of the board serve at the pleasure of the EPA Administrator. So, obviously, if they start to be "problems," they have to be concerned about whether they'll be removed. They are further limited in that their staff—the persons put on the panels which actually investigate accidents—all people are chosen by the administrator and by the Secretary of Labor.

So the agencies, whose failure to regulate might be brought to light by the report of the board, control the membership of the board and the membership of the staff that investigates. There is no independence there.

Now, the National Transportation Safety Board is independent of the Department of Transportation, and it has to be that way. When the Board reports on why an airliner crashed, its investigatory role often leads to conflict with the Department of Transportation, because the board has to be free to conclude that there was a failure to enforce a regulation, or that there should have been a regulation to cover a safety hazard. A dependent board, such as in the Administration's bill, can't do that. I urge you to look again at S. 816 and see if the Board proposed there is, in fact, independent enough.

Senator LIEBERMAN. Thank you. I think you made that case very strongly.

Mr. Miller, I'm struck by your original thought of the father and son sitting with the fish they just caught and worried about whether they should eat it. I know one of the recent studies of contamination in the Great Lakes suggested that a person who eats just seven meals over a lifetime of lake trout is running a one in one hundred thousand risk of getting cancer. Where are the air toxics coming from?

Mr. MILLER. They are coming from a wide range of sources, depending upon the pollutant. One of the big ones that we're concerned about in the fish advisory that covers all of Michigan's inland lakes is mercury. That one comes from a number of sources, like combustion, municipal incineration, coal burning for power generation—which we do a lot of in the midwest—and, interestingly enough, latex paint has mercury in it as slimicide and it goes into the air as the paint dries. It doesn't cause a problem in the room that you have just painted at such low concentrations, but it still can, through the environment, through the air, deposit into the water, bioaccumulate through the process we described, and be a problem. We measure it in the fish. Actual measurements have led to these fish advisories—measurements that give the data used in the reports you reference.

Senator LIEBERMAN. We are at least touching two of those three sources in this bill. Thank you.

Senator LAUTENBERG. Thank you.

Senator Durenberger.

Senator DURENBERGER. I want to follow up on that. I want to talk about the Great Lakes, and I'd like to do that with you, Bob, and also with the Great Lakes iron and steel industry.

First, I want to thank Doctor Graham for mentioning the listing of residual air polluters. We had to take that out of S. 1894 or there would not have been a Clean Air Bill, but it is still a terrific idea.

Mr. Miller, I'm going to come back and ask you about mercury in just a little bit, or make an observation, but you talked about BAP, which is benzoapyrene, whatever that is. I think, though, in part, that its source is in fuel. I wonder if you wouldn't just tell us briefly about the source of benzoapyrene since you listed it as one of the major polluters in the Great Lakes and give us some idea of the damage that it causes.

Mr. MILLER. Yes. The BAP is one of a class of compounds called polynuclear aromatic hydrocarbons—PAHs. We have picked BAP because if you control it you are probably controlling a lot of the other PAHs. What we have done is look at sources in terms of coming up with cut-offs that would address sources of BAP. It comes from a combustion process, and would come particularly from things like wood-fired boilers. Based upon what we are proposing in terms of our specific proposal, that would be about the only category source I know of that you would be looking at for BAP—wood combustion, and, namely, large wood boilers.

Senator DURENBERGER. On the issue of mercury, you indicated that one of the sources there was coal-fired plants; is that correct?

Mr. MILLER. Dave reminded me, too, that BAP comes from things like the coke ovens, also. They're major sources of BAP, also.

Mr. DONIGER. And also motor vehicle emissions.

Mr. MILLER. And you asked about mercury?

Senator DURENBERGER. The sources of mercury. You indicated one of them was fuel burning and heat combustion.

Mr. MILLER. Yes. Combustion of fuels for generating electricity—coal, in particular—incineration of any kind of waste, and then painting. There are some other sources like sludge burning and things like that.

Senator DURENBERGER. Let me just ask you and Dave Doniger about a bit of a problem that we seem to have, and that is the mercury, for example, is listed as a hazardous air pollutant, but coal-fired powerplants have always been exempt from the regulations. The utility industry is very anxious to get an exemption from this bill, as well, and the thought occurs to me, as I listen to you testify about the Great Lakes and the source of pollution, whether or not it is wise for us to consider this plea on their part.

David, do you want to respond to that?

Mr. DONIGER. I notice that there is an exemption for utilities in S. 1490. It is especially galling because it is set up so that the OMB has a strangle-hold on EPA's report to Congress. No regulations can be done for the toxic emissions from the electric utility boilers until the report is complete, and OMB has the final word on when that will be. I would encourage you not to copy this proposal.

The electric utility industry's emissions of radionuclides, another listed air toxic, are estimated by EPA to kill people at the rate of one person every 456 days. There is not a lot of individual risk for the average person, because almost everybody is exposed to this some. But the actual cancer death toll is, in total, considerable.

When you add mercury and organic emissions and other trace metals to the radionuclide emissions, that toll goes up. We believe those emissions—which are all susceptible to control through the same kind of particular control measures—ought to be imposed as part of the MACT program.

Senator DURENBERGER. So if I'm interested in taking my sons fishing, right now we go on Rainy Lake where there are walleyes. If I'd like to get on Lake Superior or on some of the other lakes and fish for lake trout and so forth, you suggest that I need to get the electric utility industry involved in clean air and also deal with the coke oven problem, as well; is that correct? Do both of you have a reaction on that?

Mr. MILLER. Yes. And remember what you're saying in the bill and what we're saying—of course, industry is concerned. For the utilities, this could be a great expense. The way you would control mercury from a powerplant is by putting on a scrubber of some sort and then be condensing. The lowering of the temperature condenses this volatile metal, and you collect it. Acid rain controls, if you're using scrubbers, would probably collect mercury, also.

They say this would be very expensive, but it's built into the law that you will consider the expense. MACT considers the cost and the impact. All we're saying is—and I would suggest it—don't exempt them from that review. Include them in it like you would

any other source and require the MACT review there as you would any place else.

Senator DURENBERGER. I have a question I'd like to ask Mr. Williams, but I'll defer until others——

Senator BAUCUS. Go ahead.

Senator DURENBERGER. About coke and everything that has been said about it here, I have a great interest in the Iron and Steel industry in Minnesota because we have a lot of iron ore, and we'd like you to use as much of it as possible. Over the 11 years that I have been here, I have spent a fair amount of time with the steel industry trying to be helpful in one way or another.

But it has occurred to me, as I have approached this whole issue of clean air—and I'd like to get your reaction to it, and then maybe Dave Doniger, because he wanted to say something a little bit earlier in reaction to this—that if we invest all of our time and our energy and our current research—and we have tried to help you with voluntary restraints on imports and a lot of things like that to give you the resources to get into the research—that rather than just concentrating on researching emissions control technology, that the efforts that you referred to that you're working on with the Department of Energy now on continuous casting, and so forth, that maybe the industry ought to be thinking about the better ways to make steel that don't involve the use of coke.

And so if we are talking appropriate dollars by the year 2004 or 2005, or whatever it is way out there when this thing gets fully implemented, wouldn't we be smarter right now, as an industry, to be thinking about the better ways to make American steel than the testimony which says "Thou shalt not try to regulate us out of business by regulating the emissions from coke ovens?" Maybe you can help me in your response to that by giving me some specifics as to the real cost. When you say tens of billions of dollars, that's very unrealistic. Is there a way to be more specific? Is there a way to be more specific about the time lines that would be involved in new production technology?

Mr. WILLIAMS. No. I would agree with you that we should be, and I would say that we are seeking new technologies, whether it be in new continuous casters, whether it be in better combustion control systems on heating furnaces to lower energy requirements and pollution, and then, again, looking at direct steel making to replace coke ovens. It is not necessarily focused on replacing coke ovens. It would probably be a more efficient—could be—and a better controlled system cost-wise for making steel. So we will continue to look at these.

Unfortunately, as I tried to point out, that technology is not developed yet. It will be some years away before it is, so it is a little uncertain. So I believe, if nothing else, we have a timing problem and we have a cost problem, because in the last several years in some of our modernization we have put a lot of money into upgrading our BOF shops, our blast furnaces, and our coke ovens. And they're not the kind of structures that after putting \$250 million or \$300 million into a single blast furnace that you're going to walk away in eight years and go to a new technology. There is a lot to be paid down there over a period of time.

So it would be a matter, as this evolves, of how soon you can develop it, but also how soon you can find the funds and implement the new technologies.

In the meantime, then, we're stuck with the problem of taking the facilities we do have and putting money into research and developments—which we are doing—to control them to the degree that is being asked now and will be asked more in the future, and then still be able to have this transition to new processes down the road. So we have a doubled-barreled problem of research and funding to take care of what we have now until new technology comes, and I don't know when it will come, whether it is going to be 10 years, 20 years, or 30 years. That's a very revolutionary process, but we are pursuing it, and we should. You are absolutely right, Senator.

Senator DURENBERGER. Mr. Doniger, would you like to respond to that?

Mr. DONIGER. The concern that I have is reflected in the comments of the industry spokesman cited in the New York Times article I will get you. If the industry takes its conservative approach of under-investing in these technologies, we'll end up with an industry which is uncompetitive and extremely dirty in 10 or 20 years. The right way to go is to aggressively pursue this new technology and beat the environmental problem, the economic problem, and the energy efficiency problem all at once. It will take money and it will take time, but there is not enough money and not enough urgency now being put to this.

Senator DURENBERGER. Thank you, Mr. Chairman.

Senator BAUCUS. Mr. Jeffords.

OPENING STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

Senator JEFFORDS. Thank you, Mr. Chairman. First, I'd like unanimous consent to put my statement in the record.

Senator BAUCUS. Certainly.

[Senator Jeffords' statement follows:]

OPENING STATEMENT OF HON. JAMES M. JEFFORDS, U.S. SENATOR FROM THE STATE OF VERMONT

Thank you, Mr. Chairman, for convening this important hearing. We are here to take testimony on what I think are two very good bills addressing critical environmental issues. In a sense, today is the kick-off for a series of clean air hearings, and as the task before us is demanding and the issues plentiful, I'll keep my statement brief in order to get on with the business at hand.

We're here to discuss two bills addressing separate, but related issues. S. 816 and S. 196 seek to put in place reasonable and effective regulations for toxic air emissions, municipal incinerator emissions and incinerator ash disposal. These rules are important for our country and can serve as a model for other nations of the world facing similar problems.

In drafting these bills, we have not lost sight of the ultimate goal of assuring healthy, breathable air to all Americans. We remain convinced that of all rights important to our citizens, the right to a clean and healthy environment is paramount.

S. 816, the Toxics Release Prevention Act of 1989, eliminates ambiguities that have spawned reams of litigation each time the EPA sought to move or stand still. This circus of legal challenges has thwarted the effectiveness of past legislation, and as a nation we have suffered as our air has become more toxic. The bill we consider today lists the priority pollutants that EPA shall regulate, and it establishes clear guidelines for doing so. No longer will Americans be denied protection from pollu-

tion while courts entertain arguments over the intention of Congress and the parameters of pollution.

The bill establishes a realistic timeframe for industries to install the best of available control technologies. It gives clear authority to the Administrator of the Environmental Protection Agency to order further controls or management changes if emission levels remain too high. This bill requires that any facility that does not meet a strict criteria for toxic emissions be shut down.

Mr. Chairman, we recently learned that U.S. industries annually emit billions of pounds of hazardous air pollutants into the atmosphere. It comes down to about 10 pounds for every individual in the country. Some people are more vulnerable than others, due to such factors as geographic location and physical sensitivity.

Because it has proven impossible to regulate pollutant-by-pollutant, we have devised a method by which major sources of pollution are categorized by inherent similarities, and we have required each source in a category to install controls equal to the toughest that have been achieved in practice. If this does not assure an adequate margin of safety for those people who are most exposed to the emissions, then EPA must order stricter controls until such safety level is assured.

There remain questions as to definition of acceptable risk and the methods by which these assessments will be done. Similarly, I know that some of the groups represented here question the process by which EPA will come to define maximum achievable control technology. Today's hearing will shed light on these and other issues.

S. 196, the Municipal Waste Combustion Act of 1989, sets forth much needed national rules for an increasingly popular method of solid waste handling. As local decision-makers contemplate incineration as part of their solid waste plan, it is imperative that federal regulations be clear, comprehensive and provide safeguards for air emissions and ash disposal.

New incinerators must meet the best available technology standards that have been achieved in practice, and existing sources are given a realistic time period to match these standards. The Environmental Protection Agency is required to set numerical standards for particularly important pollutants and to put forth standards to ensure efficient combustion.

The bill requires that comprehensive solid waste management plans, consistent with RCRA and including a 25-percent recycling goal, be developed before an incinerator may be permitted. The facility must also demonstrate an ability to dispose of its ash for a period of at least 5 years before its permit is approved. Emissions must be monitored and permits must be renewed and periodically upgraded.

For disposal of incinerator ash, a new section requires the EPA to promulgate regulations for all phases of handling and disposal. Preference is given to disposal in a facility with two liners, leachate collection and ground water monitoring. A monofil with one liner may be used if the fly ash is pre-treated to remove hazardous constituents. Sanitary landfills may be used if the fly ash is neutralized and tested and not found to be hazardous. Reuse or recycling of ash may be considered only after complying with new standards to be issued by EPA.

There has been much debate over incinerators as a part of our solid waste strategy. Today's hearing will serve to further enlighten the committee on current technologies and available options. In addition, we should come away better informed of the future rule of incineration as part of a comprehensive solid waste plan.

Mr. Chairman, the experts to testify before us have many important suggestions for improvements to these bills. I am pleased that most, if not all of the witnesses represent groups that have previously participated in the crafting of these bill. We are grateful for their continuing interest, and look forward to working together to enact a much needed law.

Next week we begin a long string of hearings on other aspects of amendments to the Clean Air Act. The bills before us today, and the methods by which they have come before the Subcommittee today, are a fine example for a successful process.

Thank you, Mr. Chairman.

Senator JEFFORDS. Most of the questions I had in mind have been asked.

Mr. Miller, my State is bound on the west by Lake Champlain, which is the sixth largest freshwater lake. We are getting our first warnings with respect to fish—PCBs and mercury. I watched with interest your answers to questions and your testimony.

What has been the economic ramifications on commercial fishing and sports fishing by the issuing of these warnings? Has it been a

problem of sales of fish commercially or of number of sportsmen declining in the sense of revenues for that aspect?

Mr. MILLER. I don't have data available at my fingertips that I can answer that question for you. It certainly is expected that it has that effect. That's something that I'll go back and take a look at and see if there is any data available in the State that I could find to provide that for you.

Senator JEFFORDS. I'd appreciate it if you'd do that, sir.

Mr. MILLER. If I might, while I have the floor, now that I've cleared my head a little in response to Senator Durenberger's question—

Senator JEFFORDS. Go right ahead.

Mr. MILLER. Any incomplete combustion source would be a source of PAH, so a mobile source, a fireplace, all of those would be PAH sources. Thank you.

Senator JEFFORDS. Thank you.

That's all I have, Mr. Chairman.

Senator BAUCUS. Thank you, Senator.

Mr. Williams, obviously there is a question or a problem as to how far to go in adopting new technologies to reach new environmental protection. That's the age-old question. Frankly, just as this country faces environmental problems, this country also faces competitive problems. We all know that the United States is very deeply involved in international trade competition. Certainly the steel industry is one of the best examples, and there are many other examples. There is a long list of literature indicating that the United States is letting other countries develop certain technologies to our detriment—to the detriment of America.

You know that when the Congress first passed the Clean Air Act in 1970 there was no technology then available. And, as the auto industry had no existing technology then to meet the mandated emission control standards set by that act, the industry said it couldn't be done because there is no technology. Congress, however, reacted to the outcry of pollution—urban smog, for example—and set standards. Lo and behold, we are now producing cars that do meet those standards.

At the same time, there is a fairly direct correlation—as I'm sure you know—that whenever a company or an industry develops a new environmental control technology that is at all significant there is an opportunity for that company, that industry, to then increase its productivity and increase its efficiency and increase the processing efficiency and the manufacturing efficiency based on the productivity of that company.

And, as we face more difficult and keener environmental trade competition, it seems to me that there is a greater obligation and more of a mandate of management to its shareholders, and Congress to constituents we serve, to try to find ways to increase our competitive edge as well as address our environmental concerns.

I'm wondering why an industry such as the steel industry would not, in some way, look forward to very tough, tight environmental controls, going back to its shareholders and whoever supplies capital—capital markets, equity, or debt markets, or whatever—and saying we've got to do this, knowing that this is an opportunity for you, the steel industry, to be even more competitive so we're not

worrying about VRA's or any voluntary restraint on imports of steel into this country. In fact, we're putting the bee on those other countries. They're clamoring for VRA's because we've got such an efficient steel production in this country.

In addition, it seems to me that we Americans want to also develop environmental technologies not only for ourselves, but that we can sell overseas. We know that the world is getting smaller. We have seen the world adopt the Montreal Protocol's CFC production. It is amazing what has happened in the CFC production. It is totally amazing. Who would have guessed a few years ago that the major industrial countries of the world would agree to totally phase out production of CFCs? Unthinkable a few years ago; yet, it has happened because of people's worries about skin cancer with the deterioration of the stratospheric ozone layer. And the same kinds of concerns are now developing with global warming in the world. It is incredible to me how much to the forefront global warming and other world-wide environmental issues have risen.

So I think that we would want to develop the environmental technologies not only for ourselves, but to sell overseas to our competitors, improve our trade imbalance, and also particularly to the developing countries as they coming up as they, too, have to face this enormously difficult problem of how they are going to provide an economic base and economic wherewithal for their people and yet, at the same time, environmental protection for their people.

That's a long question, but the question is: I'd just like you to comment very briefly on why it isn't better. Why wouldn't the steel industry want some pretty tough, strong controls mandated by Congress toward definite—businessmen abhor uncertainty—we could make it pretty certain, and then you could go out and do your business and increase your productivity and start selling more steel overseas and selling environmental technologies overseas? What's wrong with that?

Mr. WILLIAMS. That's a great story, and I like it. But I think, getting back to your initial statement there, I don't have any numbers now, but I would venture that only a small percentage of environmental control investments and the maintenance of environmental control systems over the years contributes that much to our cost competitiveness.

Now, there are certain areas—and this would be a question of for what reason it was done—that is, better energy utilization and lower energy costs for producing steel which results in less obvious combustion, therefore, less pollution.

But I would say, by far, most of the environmental costs—operating and capital costs—are not productive. They do not contribute to the competitiveness of our steel industry. In fact, one of the problems that we must not overlook when we talk about whether it is particulate matter in the air, any aspect of the Clean Air Act, and even toxic air, one of the problems that you're going to be faced with once you collect this material is what you do with it.

Now, that's adding cost to our system, also. And that's going to add a lot more cost, I believe, as this solid waste situation becomes more of a problem.

The second area is that we are developing technology. I mentioned the direct steel making, but we are constantly involved—the

American steel industry jointly and separately—in developing new technologies. We have, at one of our plants, a new technology just being tested for pollution control systems on a coke oven battery which we think will be a significant achievement on our part. And most of us work together on this. We do not expect to sell technology. When we develop new technology for pollution control systems in general—at least in the American steel industry—we exchange that information at no cost to one another because we think that's a contribution.

So we are for it. We know we have to do it. It is a social obligation. It is a responsibility that we have. But I wouldn't say that it is necessarily that much of a contribution to our productivity and our competitiveness as compared to the rest of the world.

Senator DURENBERGER. Mr. Chairman, may I offer a quick observation?

Senator BAUCUS. Yes.

Senator DURENBERGER. Because we both sit on the Finance Committee, I think we see this in a different light than a lot of other people would. We're dealing in trade. We're dealing in tax. We're dealing in the environment. And those of us who so strongly support putting a Secretary of Environmental Protection at the cabinet table where he is able to deal on an international and a national level with the President of the United States on some of these interlocking issues—competition around the world and capital investment and the rest of these issues—it seems to me that the steel industry is one very good example of how the right hand and the left hand never seem to be connected to the same body because we treat them as totally different, unrelated public policies. And we treat them as though they are only a domestic policy and not part of a larger—

Mr. WILLIAMS. And they are.

Senator DURENBERGER [continuing]. Trans-national kind of a problem.

Mr. WILLIAMS. I would say, for example, in this consensus agreement on imports and illegal trade or unfair trade or subsidization practices and all that, I think one of the goals should be for Ambassador Hills to go out and get a consensus on pollution control and environmental control systems around the world. If they don't conform to something that we consider to be adequate and as good as ours—after all, we are in a world-wide environment—let them also meet our standards, too. That helps our competitiveness.

Senator BAUCUS. Thank you all very much. I appreciate your contribution.

We'll finish up with the final panel: Mr. William O'Keefe, Vice President of the American Petroleum Institute; Mr. Ben Cooper with Printing Industries of America with the Clean Air Working Group; and Mr. Robert Miele, Director of Technical Service for the County of Los Angeles with the California Association of Sanitary Agencies.

Let's see if we can move along here.

Mr. O'Keefe.

STATEMENT OF WILLIAM F. O'KEEFE, VICE PRESIDENT,
AMERICAN PETROLEUM INSTITUTE

Mr. O'KEEFE. Thank you.

My name is William O'Keefe. I am Chief Operating Officer of the American Petroleum Institute. I am pleased to have this opportunity to present our views on S. 816 and S. 1490.

API shares your goal of reducing risk from hazardous air pollutants. We support legislation that will improve public health without detracting from the important goal of economic growth and opportunity. We believe that the legislation under consideration must be refined to achieve both goals.

We agree that recent data collected under SARA section 313 raises serious concern about risk from hazardous air pollutants. These data demonstrate that large volumes of chemicals are being released to the atmosphere; however, it is important for decision makers and the public to understand that these data, alone, do not indicate the extent of human exposure or actual health risk.

For example, benzene is listed as one of the top 25 chemicals released. However, EPA data indicates that industry releases of benzene represent 14 percent of total emissions, but only 3 percent of human exposures.

My point is that the emissions data collected under 313 can be misleading and unduly alarming if actual human exposure is not evaluated. The importance of understanding the essential relationship between exposure and risk is dramatized by an apparent paradox—and Doctor Graham referred to this. There is a growing concern about toxic exposures occurring at a time when life expectancy and measures of human health are continuing to improve.

As you proceed with your deliberations on this important issue, we would like to call your attention to several aspects that merit adjustment. First, I want to make several points about technology-based controls.

We support such an approach, but also believe it should be based on reasonable controls for classes of sources that emit significant amounts of pollutants and that pose significant risk to public health. The required pollution control equipment should have a usable life of at least ten years.

Regulatory requirements should reflect the marginal cost of alternatives and the incremental benefits realized from reduced emissions.

The maximum control technology bench mark for a source category should be representative of a range of controls used at the best-performing facilities rather than the controls used at the single best facility.

We urge the committee to consider the economic and social cost of this legislation relative to the realistic benefits that can be expected. I can assure you that technology-based controls will be expensive—at least \$3 billion a year for my industry. And this does not include either the cost of the residual risk requirements or of the far-reaching catastrophic release program.

My point is simply that the health benefits anticipated from stringent MACT requirements should be weighed against their consequences—the impact on industrial operations, the potential of ex-

porting jobs overseas, and reduced domestic oil production. For example, stringent MACT requirements could force over 100,000 oil producing stripper wells to be shut down.

Second, we are most concerned about the numerical risk limits in S. 816. S. 816 uses extremely conservative risk methodologies when more scientifically superior methods are available. EPA Administrator William Reilly recently indicated that " * * * the acceptability of risk is best judged on the basis of a broad set of human health measures and information. * * * Such an approach is more protective of public health than any single factor."

Third, air toxics controls should not be imposed on emissions that are inconsequential to human health. We support the provision in S. 1490 that would allow some categories to be excluded from controls based on negligible risk. Source categories with insignificant population exposure due to low emission levels, remote locations, and other factors need not be controlled.

Under this approach, we believe that oil and gas production facilities should be excluded except for individual facilities that present an unreasonable risk.

Finally, the regulation of catastrophic releases is already addressed under SARA title three, and in OSHA's process hazard management requirement and need not be further regulated by air toxics legislation.

In sum, API believes the bills you are considering provide the framework for a workable, technology-based approach. I hope you will consider the suggestions I have offered as you move ahead.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you very much, Mr. O'Keefe.

The next witness is Mr. Cooper.

STATEMENT OF BEN COOPER, SENIOR VICE PRESIDENT, PRINTING INDUSTRIES OF AMERICA, REPRESENTING THE CLEAN AIR WORKING GROUP

Mr. COOPER. Thank you, Mr. Chairman.

My name is Benjamin Y. Cooper. I'm Senior Vice President of the Printing Industries of America. I'd like to thank you for allowing me to testify today about the problems that small businesses will have in implementing the requirements of the Clean Air Act reauthorization encompassed in S. 816.

I appear here today as a representative for the numerous small businesses who are members of the Clean Air Working Group. COG's umbrella embraces such small businesses as metal finishers, furniture manufacturers, wood preservers, and dry cleaners. Other members include agricultural producers such as citrus, wheat, and cotton growers—all of whom support the goal of the Clean Air Act: to protect public health and air quality in the most cost-effective way possible. However, we fear stringent and technologically infeasible regulation under this legislative proposal.

Small business people almost always live in the communities they serve, so it is in their best interest to have clean air. However, most small business operators are unclear as to what steps they must take to achieve this goal. It is difficult for them to comply

with regulations that do not reflect their unique small business situations.

Small operators have neither the technical capabilities nor the human resources to devote to complying with these requirements.

In my role as senior vice president of the Printing Industries of America I have been working with several trade associations to develop a small generator technology assistance program to assist the small business community with these regulations. If we use an average-sized printing plant as a model for small business, we will see that the job of environmental compliance generally falls on the individual owner, whose first priority is to run his or her business.

Most owners simply cannot devote the necessary hours to fully understand and properly implement these requirements. However, if that business had access to technical expertise through a small generator technology assistance program operated at the State level, the goals of the Clean Air Act could be achieved by these small operators. Such an office could provide information on equipment, products, methods, and funding to help that small business person develop the strategy to reduce the emissions of toxic and volatile organic materials, and do so without being an adversary to that small business.

We are not asking for an exemption for any business. Rather, we are looking for a means of compliance which will allow flexibility. One of the difficulties with S. 816 is the threshold for major source. This could throw virtually every printer into the major source category with all of the requirements that entails. Small printers would probably not be able to utilize the best available technology. We expect that this would force many of them into non-compliance and possibly out of business.

Allowing the major source threshold to remain as it is in the current version of the Clean Air Act, plus the institution of a small generator technology assistance program, would accomplish the goals of the act and allow small businesses to continue to prosper and contribute to their local, State, and national economies.

What is this small generator technology assistance program? It is a non-adversarial State entity with several important functions. First, it would provide information on products that are environmentally responsible, equipment which would release the least amount of toxics, and methods of operation which could control releases to the air.

Second, this office would be able to use this information to help individuals set up a plan for reducing emissions, which is practical and economically achievable.

Finally, such an office as a State entity could enter into a formal agreement with the businesses to make the mutually-agreed-upon plan a part of the operating permit for the facility.

The seeds for the office described above are already contained in S. 816, and they only need to be used to achieve the results. For example, under the bill's information transfer provisions the EPA could develop a number of alternate technology guidelines—not just the best available technique for control of air emissions, but a variety of methods which could be used in a number of circumstances.

Information from EPA could then be provided to each State for use in its technology assistance office. The formation of the office could be established as a requirement of an acceptable State implementation plan, and the State could be provided with at least two possibilities for paying for the establishment of such an office.

Most importantly, information could be allowed to flow to the users who need it the most.

We are pleased to note at this point that this program has been included among the amendments approved in the House subcommittee markup yesterday.

S. 816 has generated several other concerns in the small business community. I'll simply mention two.

First, the area of source definition's ambiguous nature could, by default, include anything and everything. The small generator technology assistance program, however, if implemented correctly, would obviate the need for an area source and would prevent treating all companies and businesses as though they were one, single source.

Second, small business industries or agricultural producers which potentially could be controlled as an area or major source may already be regulated under a variety of other environmental as well as work place protection statutes. In having to comply with clean air regulations, small businesses and agricultural producers could be put in a position of noncompliance and in violation of these other statutes. Attached to my testimony are specific examples of this situation.

This concludes my oral testimony.

We are appreciative of this opportunity to express some small business concerns. The committee should expect to receive additional written testimony from the American Furniture Manufacturers Association, the American Textile Manufacturers Institute, the Alliance of Textile Care Association, the National Association of Metal Finishers, and the Screen Printing Association on the potential impacts of S. 816. In fact, I have the American Furniture Manufacturers testimony with me.

I also want to particularly thank the American Furniture Manufacturers Association and the National Federation of Independent Business and the Small Business Legislative Council, who have worked with us in developing the small generator technology assistance program.

Thank you very much.

Senator BAUCUS. Thank you very much, Mr. Cooper.

Mr. Miele.

STATEMENT OF ROBERT P. MIELE, DIRECTOR, TECHNICAL SERVICE, COUNTY OF LOS ANGELES, REPRESENTING THE CALIFORNIA ASSOCIATION OF SANITATION AGENCIES

Mr. MIELE. Thank you, Mr. Chairman.

My name is Bob Miele. I am with the Los Angeles County Sanitation Districts, not the City of Los Angeles as indicated in the testimony listing. Actually, I am here today representing the California Association of Sanitation Agencies.

CASA is an association of approximately 90 wastewater treatment agencies in California. We serve the needs of some 12 million people and the associated industries and commercial establishments in California. I don't want you to think that it is only the California POTW's who are concerned about this issue of air toxics. As the Chair of the Pretreatment and Hazardous Waste Committee of the Association of Metropolitan Sewerage Agencies, which is a nationwide association of the 100 largest POTW's in the country let me assure you that we too are getting increasingly involved in and concerned about air toxics.

It may be symbolic that I am the last speaker in this panel today and that I follow a number of industrial representatives, because the fact of the matter is that's sort of what happens in real life. Many of these folks discharge their materials into our POTW's. We tend to be at the end of the line.

POTW's have been listed in some studies as a potential major source of air toxic emissions—at least the large ones have been. In addition, I am sure that all POTW's will be covered in your area source regulations.

California has been out front in this whole issue of air toxics—particularly in Southern California, where the South Coast Air Quality Management District has had, for the past year, proposed air toxic regulations. POTW's have been doing air toxic emission studies in California, and I have with me today a report that summarizes the work that we've done on the impact of toxic air emissions on California POTW's. I would ask that this report be submitted for the record.

In the work on air toxics that we have done over the past year we have learned a great deal. However, one of the most important things that we have learned is that we don't know nearly enough about air toxic emissions from POTW's.

I submit that POTW's are unique when it comes to this whole issue of air toxics. I'm sure that everyone who comes before you tells you that they are unique. But let me, tell you how POTW's are unique among all of the potential major source categories. POTW's are in the business of protecting the environment, but now we find that the systems we employ to protect the environment are potentially having an adverse effect on the environment.

POTW's are also unique in that that don't generate air toxics in the conventional way. As I indicated before, we are the recipient of materials from various sources. We receive potential air toxic materials from industrial discharges as well as the water supply and common household items like bleach, paint thinners, and toilet bowl cleaners. All of these sources and materials have the potential of becoming air toxicants when they reach a POTW.

Control of air toxics at a POTW will be complicated. BACT, as currently envisioned, may not be applicable at POTW's. Many wastewater treatment processes may actually promote air toxic emissions. In any case, conventional wastewater treatment processes are not designed to control air toxic POTW's do not simply have a smokestack onto which we can just add BACT.

Another unique thing about POTW's is that we do not control our raw material. As an example, at one of the Los Angeles County Sanitation District's treatment plants, sampling that we have done

for air toxic emissions indicates that approximately 90 percent of the air toxicants comes from chloroform. The chloroform results from chlorination of the drinking water supplies. So the idea of being able to control that material is different than you would see in an industry. It would neither be practical nor prudent to go to every single home on our system and tell them to stop discharging chlorine.

Before effective control of toxic air emissions from POTW's can occur we feel that the EPA, in cooperation with POTW's, must undertake a number of tasks.

To begin with, EPA must establish standardized sampling techniques; modeling techniques, and risk assessment methodologies for POTW's. While I did not come today prepared to discuss a risk assessment, I can tell you that our agency has been impacted by existing risk assessment methodologies which have been used to regulate our solid waste disposal operations. This experience would reaffirm some of the things that you've heard today that risk assessment may be more of an art than a science.

In addition to the above, POTW's and EPA must conduct studies to determine the relative amounts of POTW air toxicants received from industry and domestic sources. Further, POTW's need to design demonstration projects aimed at developing control technologies to remove air toxics at POTW's. In parallel with this effort EPA and POTW's must assess the effectiveness of existing pretreatment programs to prevent air toxicants from POTW's. Lastly, the impact of new categorical standards that have been mandated by the 1987 amendments to the Clean Water Act on eliminating air toxic emissions to POTW's must be studied.

In conclusion, POTW's are not asking to be exempted from air toxics regulations. What we are asking for is the opportunity and the time to work with the EPA to develop meaningful ways to control air toxics without disrupting our ability to treat wastewater.

With that, I will conclude my testimony. I'd be happy to answer any questions.

Senator BAUCUS. Thank you, Mr. Miele.

Mr. O'Keefe, I was a little puzzled by your statement that the effect of S. 816 could have the effect of shutting down over 100,000 strippers. Why would that be?

Mr. O'KEEFE. My statement, Senator, said that the stringent application of MACT could have that effect. These wells produce very small quantities of oil—10 barrels a day or less. If very stringent requirements were imposed at a high cost, it would not be economically justifiable for many such wells to remain in operation.

Second, most of them are located in very remote areas where the emissions levels—using EPA's emission factors—are very low. They do not represent a source of serious risk.

I was just using that example to illustrate the importance of considering benefits relative to the full range of economic and social consequences.

Senator BAUCUS. But the bill provides that for small area sources EPA is supposed to undertake a national effort to try to set some policy and some guidelines over a 5-year period as to what to do about those categories. So if the bill is enacted as is, it seems to me that there would be a good number of years first in which these

provisions would not apply to the strippers, and, second, to try to figure out some way to address the problem that you address, which applies not only to strippers but to other small area sources.

Mr. O'KEEFE. My statement was in the context of taking into account the requirements, the extent of reductions, the health benefit, and the consequences. I was just using stripper wells as an example.

Senator BAUCUS. I see. Now, did I understand you correctly to say you feel that the oil and gas industry should be exempt?

Mr. O'KEEFE. Not the industry. The production end of the industry.

Senator BAUCUS. The production end.

Mr. O'KEEFE. There are these oil and gas production facilities that are generally in remote locations, and—

Senator BAUCUS. Refineries?

Mr. O'KEEFE. No.

Senator BAUCUS. Just production.

Mr. O'KEEFE. We're talking about the production of oil and gas.

Senator BAUCUS. Just the production.

Mr. O'KEEFE. Those that are in remote locations. Based on EPA emission factors we believe that emissions are low—on the order of 10 to 20 pounds each year. We believe that facilities should be exempt where the evidence suggests there is a negligible risk. That permits you to allocate resources to sources of higher exposures—those where it is likely to be a larger risk—instead of to areas where the payoff is likely to be very small.

Senator BAUCUS. You make a good point. It is good to set our priorities, because we only have a certain amount of resources in any endeavor. The more we set priorities, the more we are focused, the more we tend to get the job done.

Senator Durenberger was called away. He had to Chair the Long-Term Health Care Commission. He is the vice-chairman of that commission. I am, too, but he was called back there; otherwise, he'd be here. He wanted me to let everyone know that he would be here but for the duty he has to undertake at another hearing.

This concludes this hearing. I want to thank all of you for coming. You have been very constructive and helpful. Thank you very much.

This hearing is adjourned; however, the committee will reconvene at 3:00 for a hearing on S. 196.

[Whereupon, at 12:35 p.m., the subcommittee was recessed, to reconvene at 3:00 p.m. the same day.]

[Statements submitted for the record and the bill, S. 816 follow:]

STAPPA / ALAPCO

STATE AND TERRITORIAL
AIR POLLUTION PROGRAM
ADMINISTRATORS

ASSOCIATION OF
LOCAL AIR POLLUTION
CONTROL OFFICIALS

S. WILLIAM BECKER
EXECUTIVE DIRECTOR

Testimony of

Bruce K. Maillet
Director, Massachusetts Division of Air Quality Control

on behalf of the

State and Territorial Air Pollution Program Administrators
and the
Association of Local Air Pollution Control Officials

on S. 816 and S. 1490

before the

Senate Environment and Public Works Subcommittee on
Environmental Protection

September 21, 1989

Testimony of
Bruce K. Maillet
Director, Massachusetts Division of Air Quality Control
on behalf of the
State and Territorial Air Pollution Program Administrators
and the
Association of Local Air Pollution Control Officials
on S. 816 and S. 1490
before the
• Senate Environment and Public Works Subcommittee on
Environmental Protection

September 21, 1989

Chairman Baucus, Members of the Subcommittee, my name is Bruce Maillet, and I am the Director of the Massachusetts Division of Air Quality Control. I appear here today on behalf of STAPPA--the State and Territorial Air Pollution Program Administrators--and ALAPCO--the Association of Local Air Pollution Control Officials. I currently serve as Vice President of STAPPA and as Chairman of the association's Toxics Committee.

STAPPA and ALAPCO are the two national associations of air pollution control agencies in the 54 states and territories and more than 165 major metropolitan areas across the United States. The associations' members are directly responsible for implementing this nation's air pollution control laws and regulations; our primary goal is to provide our citizens with clean, healthy air. On behalf of both STAPPA and ALAPCO, I thank you for inviting me to testify on the two air toxics bills currently being considered by this Subcommittee, S. 816--the Senate Environment and Public Works Committee proposal--and Title III of S. 1490--the Administration proposal.

Our nation is facing a significant health threat from exposure to toxic air pollution. According to EPA data collected under Section 313 of the Superfund Amendments and Reauthorization Act (SARA), in 1987, approximately 2.7 billion pounds of toxics were emitted by industry into our nation's air. Though this figure is indeed astonishing, it may, nonetheless, underestimate the magnitude of the air toxics problem posed by routine and accidental releases, in that not all sources of toxic air emissions reported data under SARA Section 313.

EPA has estimated that the individual risk associated with exposure to routine releases of toxic air pollutants may run as high as one in 100 in some locations and that as few as 26 pollutants--which represent only a fraction of the total inventory--are responsible for 2,800 excess cancers annually. The scope of the problem posed by toxic air pollutants is further magnified by the noncancer effects, birth defects and noncancerous kidney and lung diseases associated with exposure to air toxics, as well as by the mutagenic and teratogenic effects that result from the reaction of toxic pollutants in the urban atmosphere.

As startling as these facts seem, they represent only part of the enormous threat posed by air toxics. Risks associated with accidental releases of toxic air pollutants add an entirely new dimension to the problem. EPA studies indicate that between 1981 and 1985 nearly 7,000 accidents involving toxic chemicals were reported ("Acute Hazardous Events Data Base"). These accidents

resulted in 138 deaths and close to 5,000 injuries and forced over 200,000 people to evacuate their homes. Further, in their wake, they left extensive environmental and property damage. A study of 64 accidental releases over a 28-year period indicates that the average economic impact per incident was \$30 million.

Clearly, public health is severely jeopardized by exposure to toxic air pollutants. In fact, in "Unfinished Business: A Comparative Assessment of Environmental Problems," published by EPA in 1987, the agency asserts that the risks to public health from air toxics far exceed those from most other environmental media. It appears to have become acceptable to allow risks from air pollution that are more than 1,000 times higher than risks permitted from other environmental media. Yet, in spite of overwhelming evidence that the most widespread human exposure to toxic pollution occurs from breathing the air around us, the federal program for regulating hazardous air pollutants has been largely ineffective to date.

Section 112 of the Clean Air Act was designed to protect the public from "air pollution which may reasonably be anticipated to result in an increase in serious irreversible, or incapacitating reversible, illness." Pursuant to this charge, the provisions of Section 112 require EPA to identify hazardous air pollutants and, accordingly, to set national standards. Unfortunately, in practice, the process established in Section 112 has yielded

very little progress; in the past 19 years, EPA has listed only eight hazardous pollutants and has set national standards for only seven of these. In addition, EPA action to regulate air toxics has been further paralyzed by recent court decisions concerning vinyl chloride and benzene.

Clearly, a comprehensive and effective regulatory program must be enacted to adequately address the insidious threat posed by toxic air pollutants; STAPPA and ALAPCO applaud the Committee for its efforts in developing S. 816. The associations believe this bill provides many of the tools necessary to facilitate the regulatory process and aggressively control air toxics. In addition, STAPPA and ALAPCO are pleased that the Administration has acknowledged the serious air toxics problem facing our country by including a comprehensive control program in Title III of S. 1490.

We are pleased that the structures of both S. 816 and S. 1490 embody many of the principles supported by state and local air pollution control officials. The bills identify an extensive list of hazardous air pollutants; control industrial sources of air toxics by regulating categories of sources; establish a technology-based approach on such sources; address risks remaining after the installation of initial controls; seek to control toxic emissions from area sources; and include provisions for the prevention of accidental releases.

While the structures of S. 816 and S. 1490 are similar, and indeed sound, significant differences remain with respect to many important substantive provisions. Accordingly, STAPPA and ALAPCO offer the following specific comments on the two bills.

STAPPA and ALAPCO are extremely pleased that both S. 816 and S. 1490 contain provisions for accelerating the regulatory process and expediting the application of controls. The Committee bill refers to a yet-to-be-published Committee Print that will include a list of toxic air pollutants, while the Administration proposal actually identifies over 190 chemicals. However, although both of these proposals provide the foundation for a strong regulatory program, we suggest that the full list of air toxics be expanded to include additional substances. For example, we note that almost 20 percent of the chemicals with the highest reported releases into the air (according to data submitted under SARA Section 313) have not been included in S. 1490. Further, the listing of only one dioxin should be expanded to include, among others, polychlorinated dibenzo dioxins and polychlorinated dibenzofurans. While we realize that both bills contain provisions for adding to and deleting from the list, STAPPA and ALAPCO recommend that the aforementioned substances be included in the initial list, in that they are known to pose a serious and significant threat to public health.

The associations also support the size thresholds in the bills that define a "major emitting facility" as one that emits more than 10 tons per year (25 tons per year in aggregate) of any hazardous air pollutant. We also believe the provision allowing the EPA Administrator to set lower thresholds is appropriate. In fact, the Great Lakes states have already identified seven pollutants for which thresholds below 10 tons per year are necessary in order to protect public health and the environment in and around aquatic ecosystems from the impacts of the bioaccumulation of air toxics. Indeed, there may be other pollutants that warrant lower thresholds, as well.

With respect to the establishment of emission standards, STAPPA and ALAPCO are pleased with the approach taken by S. 816, which requires that emission standards be set for all source categories emitting listed pollutants. The associations believe this provision is superior to that included in S. 1490, which may allow the EPA Administrator to not regulate up to 50 percent of the listed source categories. We suggest, however, that both bills be strengthened in two respects. First, we believe that eight years--not ten--will provide EPA with sufficient time to complete promulgation of all standards. Second, we recommend that the bills include a "hammer"--or default provision--in the event that EPA fails to meet its deadline.

The associations are particularly supportive of the provision in S. 816 that requires all new sources emitting listed pollutants in major amounts to comply with the most stringent emissions

level achieved in practice. We also believe it may be appropriate to allow existing sources to meet a less stringent requirement, provided that these sources comply with, at a minimum, the Best Available Control Technology. We recommend that S. 1490 subject new sources to the same requirements as those specified in S. 816.

Once control technologies have been applied to new and existing sources of toxic air pollutants, both bills call for the evaluation of residual risk. However, there are important distinctions between the two approaches, including the level of discretion afforded EPA in determining whether there are unacceptable residual risks.

STAPPA and ALAPCO are especially pleased that S. 816 specifies a "benchmark" or "bright line" by which to evaluate individual risks from carcinogens. We believe that the one-in-one-million goal in the bill is justified, and agree with the approach allowing industry some additional time to develop the controls necessary to achieve this risk level. We suggest that the bill's risk reduction program be strengthened, and wish to work with the Subcommittee in this regard.

STAPPA and ALAPCO are concerned with the residual risk component of S. 1490. The bill does not contain a benchmark against which to measure residual risk and, instead, provides the EPA Administrator with full discretion--considering costs and technological feasibility--to decide if a second phase of controls is even necessary.

STAPPA and ALAPCO also believe that many of the deadlines for action in both bills are unnecessarily protracted. The bills allow excessive amounts of time--up to 23 years in S. 816 and up to 25 years in S. 1490--for EPA to establish standards, for sources to adopt controls, and for both EPA and regulated facilities to address residual risks.

STAPPA and ALAPCO support a system of federally-enforceable state and local permit programs that meet uniform minimum standards; the associations are pleased that these concepts have been embodied in both bills. We are particularly gratified that the bills require permittees to pay an annual fee to offset all direct and indirect costs associated with administering the program. The availability of these resources will be vital to an effective control program. We recommend, however, that the fee programs in both bills be expanded to account for the contribution of air toxics from area and mobile sources, as well. In addition, we suggest that the bills include provisions to ensure that funds equivalent to those generated through fees be retained by or returned to the state or local agency that is responsible for permit issuance and/or enforcement activities.

The associations support the concept of "certification," which will allow facilities that certify achievement of emission standards to continue operating while the permitting authority takes necessary action to make a final permit decision. However,

we urge that S. 816 be modified to limit its application to existing sources, only. Additionally, the associations recommend that temporary permits not remain in effect for more than one year.

STAPPA and ALAPCO are extremely concerned with the provisions in both S. 816 and S. 1490 that allow EPA to veto permits on a case-by-case basis. The associations believe that this level of oversight would be duplicative, resource-intensive, and time-consuming. We suggest, instead, an alternative, calling upon EPA to (1) participate in the state/local public comment period, (2) conduct a rigorous and timely audit of state and local permit programs, and (3) utilize other avenues available to address permit deficiencies. The permit-by-permit veto provision could be used as a potential sanction available to the EPA.

STAPPA and ALAPCO agree in concept with the provisions in the bills that encourage existing facilities to voluntarily reduce their air toxics emissions in an expeditious manner. We note that several industries, including Monsanto, Union Carbide and 3M, have instituted such voluntary programs in the past and we applaud those efforts. We have two concerns, however.

First, we object to the exemptions in the bills that allow sources to escape technology requirements entirely if they voluntarily reduce their emissions. It is possible that the

controls implemented to achieve such voluntary reductions will prove to be significantly less effective than the technology requirements of either bill. As an alternative, we suggest that the 90/95 percent reduction requirement be strengthened and that sources receiving a waiver be exempted from the technology requirements for a limited period only, after which they would be required to meet these requirements and/or residual risk standards.

Second, STAPPA and ALAPCO believe that limiting the applicable emission reductions to those resulting only from voluntary efforts does not adequately recognize reductions required by state and local laws. While the bills exempt sources making "voluntary" reductions from the technology requirements, they penalize sources that have already reduced emissions under state or local programs. We recommend that a temporary waiver be available to sources that have achieved significant reductions through voluntary efforts and/or measures required by state and local programs.

STAPPA and ALAPCO are pleased that S. 816 includes a specific program to address area sources of toxic air pollution. EPA has estimated that such small stationary sources are significant contributors to emissions of air toxics ("The Air Toxics Problem in the United States: An Analysis of Cancer Risks for Selected Pollutants").

STAPPA and ALAPCO believe, however, that the area source provisions of S. 816 should be modified in two respects. First, the associations recommend that the bill mandate specific area source control requirements, rather than allow EPA five years to identify such measures. Several states are already controlling such area sources as gasoline stations and dry cleaners and it is, therefore, reasonable for Congress to expand this program and accelerate its implementation. Second, while we support efforts to conduct ambient monitoring for hazardous air pollutants, we remain concerned with the resource-intensive nature of such exercises. We offer as an example the Staten Island/Northern New Jersey Urban Air Toxics Assessment Project, which monitors up to 24 substances at 13 sites; this project, while most worthwhile, costs New Jersey, New York and EPA Region II a total of \$3.5 million over two years. STAPPA and ALAPCO believe that in some areas, monitoring may play a critical role in quantifying the area source problem; we recommend however, that the language of S. 816 be modified to require monitoring only in areas that receive sufficient funding specifically earmarked for such activities.

In addition to addressing stationary sources, effective control of toxic air pollution requires regulation of toxic emissions from mobile sources. Yet, while both S. 816 and S. 1490 call for studies of the impacts of mobile source toxics emissions, neither bill contains a comprehensive regulatory program to

control these substances. STAPPA and ALAPCO urge that the bills be strengthened to require EPA to set mobile source regulations for important toxic air pollutants, such as benzene, formaldehyde, and 1,3 butadiene.

STAPPA and ALAPCO believe that it is important for state and local air pollution control agencies to play a significant role in controlling toxic air pollutants. This is consistent with Section 101(c) of the Clean Air Act, which specifies that "the prevention and control of air pollution at its source is the primary responsibility of States and local governments." Consequently, we are pleased that S. 816 and S. 1490 allow EPA to delegate responsibility for air toxics programs to states. We would also like to stress the active and vital role that local agencies play in controlling air toxics. Accordingly, we urge revisions to the language of the bills to clarify that local agencies will not be precluded from being direct participants in the regulatory process.

STAPPA and ALAPCO are pleased that, unlike S. 1490, the Committee bill addresses adverse environmental effects from air toxics. We believe that these provisions can be used, among other things, to protect the Great Lakes from atmospheric deposition of toxic air pollutants. Air toxics account for as much as 96 percent of the loadings of certain problem chemicals (e.g., Benzo-a-pyrene) into the Great Lakes. These pollutants can accumulate not only in aquatic sediments, but also through the

food chain (e.g., through the consumption of fish), creating an avenue of exposure that can be extremely potent. Since the Great Lakes ecosystem affects some of the most heavily populated areas in the country, it is extremely appropriate for Congress to take steps to protect this area from the threat of air toxics.

STAPPA and ALAPCO are also pleased that S. 816 and S. 1490 impose a legislative requirement for EPA to maintain an air toxics clearinghouse, control technology center and risk information center. Over the past several years, STAPPA and ALAPCO have worked in cooperation with EPA to enhance such efforts through the National Air Toxics Information Clearinghouse, the Control Technology Center and the Air Risk Information Support Center; in that these information sources are of great assistance to state and local agencies, we believe that a legislative requirement will facilitate our efforts and ensure that these activities are given adequate priority within EPA.

Finally, the associations support the general principles around which the Committee bill's program to address accidental releases is structured. The requirements for facilities to conduct hazard assessments will greatly enhance our ability to prevent accidental releases of extremely hazardous substances. In addition, a Chemical Safety and Hazard Investigation Board should play a constructive role in the investigation of chemical accidents.

In conclusion, STAPPA and ALAPCO compliment the Subcommittee for its leadership in addressing toxic air pollution. We commend your efforts to develop a strong and comprehensive program to effectively reduce risks from exposure to air toxics and offer our cooperation as you continue to debate this issue.

Thank you.

PROGRESS IN DEVELOPMENT OF A BIOLOGICAL TESTS SYSTEM TO
DETECT THE EFFECTS OF AMBIENT AIR

JAMES H. PRICE AND JOANN M. WIERSEMA

TEXAS AIR CONTROL BOARD
AUSTIN, TEXAS

MARVIN S. LEGATOR

UNIVERSITY OF TEXAS
GALVESTON, TEXAS



AIR & WASTE MANAGEMENT
ASSOCIATION

•
SINCE 1907

For Presentation at the
82nd Annual Meeting & Exhibition
Anaheim, California
June 25-30, 1989

Background

A major uncertainty in air pollution control work is the relative human toxicologic importance of air contaminants that are emitted directly and ones that are formed in atmospheric reactions. They are called, respectively, primary and secondary air contaminants or pollutants. As the inorganic and organic compounds in ambient air react through photochemical and other processes, they are converted into an enormous variety of intermediate and final products^{1, 2}. There is no reasonable prospect that they will be fully identified and that their toxicity will be tested within the next several years. One difficulty is that many of the compounds are not stable; they may spontaneously rearrange quickly, react with other compounds in air, or react in various stages of collection, fractionation, and analysis.

The uncertainty about the toxicological importance of secondary air pollutants creates a major problem: It leaves regulatory agencies unable to determine the relative importance of reducing emissions that are directly toxic and of reducing emissions that are not directly toxic but that contribute to photochemical reactions or that may be transformed into toxic products as a result of photochemical reactions.

Another reason for uncertainty about the human health effects of air contaminants is their possible interaction in exposed persons. In occupational and home settings there are numerous examples of synergistic interactions among environmental agents. On the other hand, synergistic interactions have not been demonstrated among air contaminants present in the parts per billion to parts per trillion range. Except in unusual circumstances most individual air contaminants in urban air are present in this range. Because most interactions of environmental contaminants in human beings result from competitive interactions, shifts in reduction-oxidation potential, or enzyme induction affecting the metabolism of one or more of the compounds, the interactions would be expected to be diminished or absent at very low exposure.

The sources of uncertainty discussed above, together with the uncertainty involved in direct extrapolation of toxicological data to low dose, make assessment of the impact of the urban atmosphere on public health uncertain. It is not feasible to learn the impact through epidemiological studies on the general

population because confounding factors cause uncertainties that are larger than the plausible level of effects that the studies are trying to identify³.

From ambient concentrations (either measured or calculated from emissions data), EPA has calculated the combined cancer risk using its unit risk factors⁴. This "Six Months Study" and follow-up work have estimated that toxic air pollutants contribute some fraction of 1 per cent to the total cancer risk for the public. The estimate may overestimate the risk because EPA uses upper bound risk factors; it may underestimate the risk because it does not consider either synergism or the transformation products of the chemical reactions in ambient air. Assessment of non-cancer risks from public exposure to toxic air pollutants is even less certain.

The use of biological monitoring systems may be the best hope of getting more reliable answers to the question of how much risk is posed by breathing ambient air. One application of such systems would be research to learn the general level of hazard associated with breathing ambient air in major cities. Another application could be to show whether or not there is a hazard in a specific neighborhood in which the citizens are worried about what they are breathing.

One biological system has been used in the field; it employs the spider wort Tradescantia, a higher plant, to detect mutations in cells⁵. The results in urban and industrial areas showed more mutagenic effects than in rural areas, and the effects were larger than could be accounted for by the known toxic air pollutants that were being measured. This result implied that there were toxic transformation products in the ambient air as well as the toxic compounds emitted directly to the ambient air. EPA and the National Institute for Environmental Health Sciences dropped the Tradescantia program.

EPA's current biological monitoring system work consists of two main parts: One is collection of particulate matter samples in the field followed by laboratory separation of the chemicals and the use of bacterial assays to identify the mutagenic chemicals present after the collection, storage, and separation process. The principal weaknesses of this approach are (1) that it misses the vapor phase materials in ambient air, (2) that many chemicals are altered or lost in the collection and separation procedures so that toxic effects are not identified, and (3) that new genotoxic chemicals are generated at least during the collection phase.

The other main part of EPA's current work is the use of bacteria on the surface of culture plates to show the mutagenic effects of vapor phase chemicals passed over the plates. Results from this work are providing indications that transformation products in ambient air may present a much more significant genotoxic hazard (and, by inference, cancer hazard) than that from the toxic chemicals in all the known chemical emissions. In the first set of experiments published in 1985, Claxton and co-workers showed that toluene, which is essentially unreactive in genotoxicity test systems, undergoes reactions in a chamber which simulates photochemical reactions that go on in urban air⁶. The toluene reacts to produce materials that cause significant mutagenic effects on bacterial plate test systems. Most of the genotoxic activity is in the vapor phase rather than the particulate phase. Further results show that photochemical activity increases the mutagenicity of wood smoke⁷ and of automobile emissions by up to 100-fold⁸. The materials accounting for most of the mutagenic activity remain unidentified, but they do appear to include small, nitrogen-containing compounds such as PAN (peroxyacetyl nitrate) and nitrous acid. EPA has no funds budgeted to take this system into the field in urban, industrial, and rural areas to see whether the results in the real world confirm the laboratory findings.

Experimental Work

The whole-animal bio-monitoring research the Texas Air Control Board has funded from 1984 to 1989 at The University of Texas Medical Branch at Galveston was begun with the hope of developing a system that could in a few weeks produce reliable, interpretable data to show the presence or absence (within reasonable detection limits) of mutation, cancer, and possibly other hazards from ambient air. In 1984 the Texas Air Control Board began contracting with the University of Texas Medical Branch at Galveston for research to develop a biological test system that could directly detect the adverse biological effects of exposure to complex mixtures of toxic materials in ambient air.

The objective of these studies was to determine the feasibility of exposing mice in a mobile exposure unit to ambient polluted air and monitoring the mice for toxic effects pertinent to the evaluation of health hazards for human beings exposed to the same air. As it is being evaluated, the biological test system involves exposing mice to test compounds in air for six weeks, then performing sensitive tests on specific cells harvested from the mice following the exposure.

The objectives of the 1988 work were to expose 120 mice for six weeks to benzene vapor in air at concentrations of zero (air only), 40, 100, and 1,000 parts per billion (ppb); to evaluate the mice at the end of exposure for the frequency of variant spleen lymphocytes resistant to the drug 6-thioguanine (TG) (These cells putatively contain mutations in the gene for the enzyme hypoxanthine-guanine phosphoribosyltransferase^{9, 10, 11, 12}; to evaluate chromosome aberrations in lung macrophages^{13, 14, 15}; and to collect materials for possible future analysis for chromosome aberrations in spleen lymphocytes and spermatocytes. Details of the experimental procedures are described in the 1988 project report¹⁶. The materials harvested from the experimental animals are listed in Table I.

Results

Both male and female mice responded to the benzene exposure with a significant increase in the frequency of TG resistant spleen lymphocytes. (See Table II.) Animals exposed to air had variant frequencies in the range of $6-11 \times 10^{-6}$ (variant cells per evaluable cells). At 40 ppb the variant frequency increased to the range of $23-32 \times 10^{-6}$, and it further increased to the range of $40-66 \times 10^{-6}$ at 100 ppb. At 1,000 ppb the frequency declined to the range of $15-30 \times 10^{-6}$. Animals housed in standard laboratory cages throughout the exposure period (cage controls) had variant frequencies in the range of $10-17 \times 10^{-6}$. At all exposure levels the female mice had slightly higher variant frequencies than the male mice. The 90% confidence intervals on the exposure group variant frequencies did not overlap. These results are consistent with the results obtained in 1987, which indicated that increasing variant frequency was induced by increasing exposures between 20 and 100 ppb.

The cytogenetic evaluation of lung macrophages (See Table III.) indicated that the frequency of aberrant cells nearly doubled from 2.9 to 5.1% between the air only and 40 ppb exposures. At 100 ppb the frequency declined slightly to 3.9% and at 1,000 ppb it declined further to 2.4%. These changes, although easily observed, were not statistically significant with the numbers of evaluable cells available. As with the TG resistant lymphocytes the females were slightly more sensitive than the males. The overall patterns of the dose-response curves were also similar. An analysis of all the lung macrophage cytogenetic data on benzene exposure collected over the last three years followed a similar pattern with observable increases over the air-only exposure even at 20 ppb and with a maximum response reached at 100 ppb.

Discussion

Results indicate that the system may be capable of detecting two types of biologically significant damage, chromosome breakage and point mutation, in the range of 20 to 40 parts per billion of the test compound. The increase in the frequency of TG resistant lymphocytes putatively indicates an increase in the proportion of lymphocytes carrying a mutation in the *hprt* gene. It is possible that other factors such as the antigenic stimulation of the cells *in vivo* may be responsible for some or all of the increase. The results should be interpreted with caution until studies now in progress to ascertain the genetic status and frequency of *in vivo* cycling of these cells are completed. The increase in the frequency of the lung macrophages containing chromosome aberrations also suggests that this benzene exposure has induced genetic damage in these mice. The consistency of the two assessments with respect to the dose-response curve and the greater sensitivity of the females support each other and suggest that a common biological process is inducing both effects.

Both of the biological assessments made on the exposed animals produced a similar response to benzene. Highly significant increases in the TG^c variant frequencies were observed at 40 and 100 ppb with a diminished response at the 1,000 ppb exposure. Similarly an increase of about two fold was observed in the rate of chromosome damage in lung macrophages at the low and middle exposure level which declined at the highest doses. When the data collected on macrophage chromosome aberrations over the last three years are combined, a clear dose-dependent increase in aberrations is seen. Although the lung macrophage assay is sensitive enough to detect genetic damage at the tested levels of benzene, the system still requires refinement to understand experimental variation and to improve the yield of mitotic cells. These results suggest that genetic toxicity and possibly other cellular effects can be detected at exposure levels close to the range of concentrations in polluted ambient air. The response to exposure appears to be complex, possibly involving the interaction of several metabolic and cellular activities which change as the exposure level is increased. Understanding of these processes will require additional and more comprehensive studies of the response of mice to low level sub-chronic benzene exposure.

The shape of the dose-response curves seen in this work raises a significant concern. Almost all risk assessment work has assumed that straight-line extrapolation from high dose to low dose is a worst-case approximation and that many dose-response curves are convex upward. The basis for many observed dose-response curves turning up more steeply as dose increases is the saturation of

detoxification and repair mechanisms as exposure increases. There has been concern that EPA's quantitative risk assessment procedures overestimate the actual risk from exposure at ambient levels and that the degree of overestimation varies from compound to compound¹⁷.

1989 Work in Progress

The objectives of the work are to complete the analysis of biological materials from the 1988 animal exposures and to characterize further the bioassays being considered for use in a monitoring system. The clonal version of the TG-resistance assay will be performed on cryopreserved spleen lymphocytes. This assay should establish whether the responses seen in the 1988 work represent mutational events or a physiological response. The spleen lymphocyte cytogenetic assay will be completed using slide preparations. This assay will determine whether an increase in chromosome breakage occurred in spleen lymphocytes with increasing exposure to the test compound. Additional lung macrophages that were prepared but not scored in 1988 will be scored to determine whether a statistically significant increase in chromosome breakage in these cells is detectable with current techniques.

Future Research to Develop Biological Monitoring Systems

The work summarized in this report indicates that the use of such systems is feasible, at least for toxicity testing at low concentrations close to actual levels of human exposure in ambient and indoor air. The desirability of biological monitoring systems that could determine the presence of hazards at environmental levels is obvious, but work to develop them will require substantial and continuing research support at the federal level; it has been absent for the last several years.

The endpoints developed so far are genotoxic effects: chromosome breakage and point mutation. Additional endpoints, including tests for damage to the immune system, need to be added. Whether systems can be developed that are adequately sensitive to detect hazards that may exist from ambient concentrations will not be known until considerable further research is conducted using a variety of known toxicants. If the systems are adequately sensitive, there will be the further question whether they give any false positive responses to compounds that do not present a hazard.

Acknowledgements

Virginia Smith and Judith Henry served as Texas Air Control Board contract officers for the work at The University of Texas Medical Branch at Galveston.

TABLE I: Specimens Collected and Processed
and Tests Performed

Tissue	Preparation	Test	Status
Spleen	Cryopreservation	TG ⁺ lymphocyte Assay Autoradiography Cloning	Completed Stored frozen for later analysis
	Culture/Slides	Lymphocyte Cytogenetic Analysis	Stored for later analysis
Lung	Slides	Macrophage Cytogenetic Analysis	Completed
Testes	Slides	Spermatocyte Cytogenetic Analysis	Stored for later analysis

TABLE II: Statistical Analysis of TG^F VP in Benzene Exposed Mice

Exposure	N	Mean V _F (x10 ⁻⁶)	Std Error of Mean	90% Confidence Intervals of Mean V _F ^a
Males				
Zero (Air Only)	3	5.7	2.3	0 - 12.6
40 ppb	3	24.7	0.8	22.3 - 27.1
100 ppb	3	40.2	2.6	32.4 - 48.0
1000 ppb	3	17.0	1.8	11.6 - 22.4
Cage Control	2	16.4	1.5	8.9 - 23.9
Females				
Zero (Air Only)	3	7.2	0.6	5.4 - 9.0
40 ppb	3	29.2	2.6	21.4 - 37.0
100 ppb	3	62.5	1.5	58.0 - 67.0
1000 ppb	2	25.6	2.0	15.6 - 35.6
Cage Control	2	13.5	3.2	0 - 29.0

$$^aCI-90V_F = [X \pm t_{.90,df}SE(X)].95$$

89.91.6

TABLE III: Chromosome Aberrations in Lung Macrophage Cells of Mice After Inhalation Exposure to Benzene^a

Summary of Results	Cage ^b Control	Benzene Conc. (ppb)			
		0	40	100	1000
Male					
No. of Mice analyzed	7	10	10	5	6
No. of Cells analyzed	176	253	241	134	151
Percent Aberrant cells (S.E.M.)	2.1 (0.9)	3.2 (1.0) ^b	4.7 (1.9) ^b	2.4 (1.6) ^b	2.7 (2.0) ^b
Percent Chromatid Breaks (S.E.M.)	2.1 (0.9)	3.6 (1.1) ^b	5.1 (2.1) ^b	2.4 (1.6) ^b	4.0 (2.5) ^b
Female					
No. of Mice analyzed	7	5	10	7	10
No. of Cells analyzed	163	126	266	175	260
Percent Aberrant cells (S.E.M.)	1.8 (0.8)	2.2 (1.5) ^c	5.5 (1.5) ^c	5.0 (1.7) ^c	2.3 (0.9) ^c
Percent Chromatid breaks (S.E.M.)	1.8 (0.8)	3.2 (2.3) ^d	6.2 (1.7) ^d	8.4 (3.2) ^d	2.3 (0.9) ^d
Both Sexes					
No. of Mice analyzed	14	15	20	12	16
No. of Cells analyzed	340	379	507	309	411
Percent Aberrant cells (S.E.M.)	2.2 (0.7)	2.9 (0.8) ^e	5.1 (1.2) ^e	3.9 (1.2) ^e	2.4 (0.9) ^e
Percent Chromatid breaks (S.E.M.)	2.2 (0.7)	3.4 (1.0) ^f	5.7 (1.3) ^f	5.9 (2.1) ^f	2.9 (1.0) ^f

^aMice were exposed by inhalation to control air or to various concentrations of benzene for 6 weeks. PPB = parts per billion and S.E.M. = standard error of mean.

^bOne way analysis of variance using square root transformed values of the data shows no significant difference ($p < 0.9$).

^c $p < 0.2$.

^d $p < 0.2$.

^e $p < 0.2$.

^f $p < 0.3$.

^gSame analysis shows cage control is not significantly different from inhalation control ($p > 0.5$) but data from female mice and from both sexes combined are different from benzene exposed groups ($p < 0.1$).

REFERENCES

1. National Research Council (NRC). Vapor-Phase Organic Pollutants (Volatile Hydrocarbons and Oxidation Products). National Academy Press, Washington, D.C. (1976)
2. T.E. Graedel, D.T. Hawkins, and L.D. Claxton. Atmospheric Chemical Compounds, Sources, Occurrence, and Bioassay. Academic Press, Orlando, Florida. (1986)
3. C.M. Shy and R.B. Struba. "Air and Water Pollution," Cancer Epidemiology and Prevention. David Schottenfield and Joseph F. Fraumini, Jr., ed., W.B. Saunders Company, Philadelphia. (1985)
4. U.S. Environmental Protection Agency. "The Air Toxics Problem in the United States: An Analysis of Cancer Risks for Selected Pollutants." (Also known as "The Six Months' Study"). EPA 450/1-85-001. (1985)
5. L.A. Schairer. "Mutagenicity of ambient air at selected sites in the United States using Tradescantia as a monitor." In proceedings of symposium on In vitro testing of environmental agents: Current and future possibilities. Monaco, France, September 22-29, 1979, Elsevier Press, New York, A.R. Kolber (Ed.). (1981)
6. P.B. Shepson, et al. "Mutagenic activity of Irradiated Toluene/NO_x/H₂O/Air Mixtures." Environmental Science and Technology, 19:247. (1985)
7. T.E. Kleindienst, et al. "Wood Smoke: Measurement of the Mutagenic Activities of Its Gas- and Particulate-Phase Photooxidation Products." Environmental Science and Technology, 20:493. (1986)
8. J. Lewtas. Personal communication. (1988)
9. R.J. Albertini, E.F. Allen, A.S. Quinn, and M.R. Albertini. "Human somatic cell mutation: in vivo variant lymphocyte frequencies as determined by 6-thioguanine resistance." Population and Biological Aspects of Human Mutation. E.B. Hook and I.W. Porter, Eds., Academic Press, New York, pp. 235-263. (1981)

10. M.M. Ammenheuser, J.B. Ward, Jr., E.B. Whorton, Jr., J.M. Killian, and M.S. Legator. "Elevated frequencies of 6-thioguanine-resistant lymphocytes in multiple sclerosis patients treated with cyclophosphamide: A prospective study." Mutat. Res. 204:509-520. (1988)
11. E. Gocke, K. Eckhardt, M.T. King, and D. Wild. "Auto radiographic detection of 6-thioguanine resistant lymphocytes of mice." A novel system in somatic mutagenesis testing. Mutat. Res. 113:455-465. (1983)
12. I.M. Jones, K. Burkhardt-Schultz, and A.V. Carrano. "A method to quantify spontaneous and in vivo induced thioguanine resistant mouse lymphocytes." Mutat. Res. 147:97-105. (1985)
13. W.W. Au, P. Bibbins, J.B. Ward, and M.S. Legator. "Development of a rodent lung macrophage chromosome aberration assay." Mutat. Res. 208:1-7. (1988)
14. W.W. Au, J.B. Ward, Jr., V.M. Sadagopa Ramanujam, B.L. Harper, M.T. Moslen, and M.S. Legator. "Genotoxic effects of a sub-acute low-level inhalation exposure to a mixture of carcinogenic chemicals." Mutat. Res. 203:103-115. (1988)
15. K. Rithidech, D.E. Bice, and A.L. Brooks. "In vivo techniques to evaluate cytogenetic damage from inhaled toxic agents using lung macrophages and lung-associated lymph nodes." Environ. Mole. Mutag. 11:88. (1988)
16. M.S. Legator, M.M. Ammenheuser, W.W. Au, B.L. Harper, V.M. Ramanujam, and J.B. Ward. "Evaluation of Genotoxic Effects from Sub-Chronic Low-Level Inhalation Exposure to Benzene in Mice." Report to the Texas Air Control Board of work performed under Texas interagency agreement IAC(87-88)0889. (1988)
17. A.L. Nichols and R.J. Feckhouser. "The Perils of Prudence: How Conservative Risk Assessments Distort Regulation." Reg. Tox. Pharm. 8:61. (1988)

NOTE TO EDITORS

Under the new federal copyright law,
publication rights to this paper are
retained by the author(s).



WRITTEN STATEMENT OF
THE
CHEMICAL MANUFACTURERS ASSOCIATION

BEFORE THE
ENVIRONMENTAL PROTECTION SUBCOMMITTEE
OF THE
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE

REGARDING
AIR TOXICS CONTROL

September 21, 1989

The Chemical Manufacturers Association (CMA) appreciates this opportunity to testify on proposed amendments to the Clean Air Act to control emissions of toxic air pollutants. CMA is a nonprofit trade association whose company members account for more than 90% of the productive capacity of basic industrial chemicals within this country.

I. SUMMARY

CMA supports effective regulation and control of emissions of toxic air pollutants and shows that support in several ways. CMA participates actively in Federal, state and local initiatives. The industry is subject to and complies with many existing legal requirements that directly control releases of toxic air pollutants. The industry also responds to concerns about toxic air pollutants through its many voluntary programs and actions. As a result, emissions from chemical plants, in general, pose extremely low risks in comparison with other sources of cancer risk.

CMA formerly opposed new air toxics legislation as unnecessary. However, in view of the Environmental Protection Agency's difficulties in establishing risk-based regulations, and the growing public concern about the quantity of air toxic emissions, we have reevaluated our prior position. We now believe that, through carefully crafted legislation, Congress can improve the functioning of the Clean Air Act to provide better control of toxic air pollutants. CMA supports amendments to the Act to improve the pace of regulation of toxic air pollutants for process emissions under the following principles:

Substances Subject to Regulation: There should not be a binding statutory list of regulated substances. EPA should consider characteristics of the substance, concentration in the ambient air, and potential for human exposure when deciding which substances are subject to regulation.

Source Categories: EPA should regulate all source categories or subcategories whose emissions are significant because of quantity and potential for exposure. For the chemical manufacturing industry, the definition of a source category or subcategory should group together only those sources within the same process unit.

Standards: Standards should reflect demonstrated technology and should differentiate between new and existing sources. Standards should apply to new sources after final promulgation. Existing sources must have reasonable compliance schedules. Standards should be consistent with the need to protect health and welfare while maintaining the nation's productive capacity.

Residual Risk: Legislation should allow EPA, after technology-based controls are in place and functioning, to determine whether an unreasonable "residual" risk remains. If so, EPA then can impose additional requirements to reduce such risk. Such determinations should be based on a scientifically-sound peer-reviewed methodology which recognizes that residual risk concerns are different for non-carcinogens and carcinogens. Legislation should not mandate specific risk levels or risk assessment methods.

Implementation: Legislation should provide for implementation and enforcement of EPA-established control requirements through state programs. The law should not create redundant state and Federal requirements. The method of implementing the standard should minimize administrative and procedural costs and delays.

Recognition of Good Performers: Legislation should provide recognition and credit for existing control practices, including voluntary emissions reductions, and avoid penalizing "good performing" sources.

CMA believes that any legislation on the prevention of accidental releases should follow these principles:

Single coordinated Federal program: CMA believes a coordinated uniform Federal program to prevent accidental chemical releases with catastrophic potential is preferable to widely divergent state programs.

Respective roles of OSHA, EPA, Coast Guard, and DOT: Any Federal program should coordinate the ongoing activities, and recognize and maintain the important respective roles, of EPA (outside the fence line), the Occupational Safety and Health Administration (OSHA) (inside the workplace), Department of Transportation (DOT) (transportation) and other agencies. OSHA should develop and administer any accident release program with participation by the regulated community. CMA supports current Federal accident prevention activities and is working with OSHA to develop safety standards.

Use of flexible facility hazard assessments: Hazard identification and assessment techniques are important parts of an overall risk management system. However, any legislation should provide for flexibility in selecting the most appropriate identification and assessment methods as well as the timing for updating these assessments. The government should not specify particular techniques such as quantitative risk assessment.

Public information: Companies should provide that risk information to the public which enables the public to make informed judgments without compromising the protection of proprietary information.

Provision for innovation: Legislation must not inhibit industry's ability to innovate to maintain a safe, efficient and competitive U. S. chemical process industry. Legislation should support management's responsibility to design and operate chemical plants in a safe, healthful manner.

The basic structure of S. 816 is consistent with many of these principles, but many specific provisions are not. In particular, S. 816:

- Establishes technology-based standards for all sources that are unreasonably stringent;
- Creates too broad a definition of "major source" that groups dissimilar process units within a facility, thus complicating the regulatory process;
- Forces the EPA to waste its limited resources by promulgating emissions standards for every listed source category or subcategory, whether or not emissions are significant;
- Establishes risk limit of one-in-one million which is unjustifiably rigid and overly stringent considering the current imprecise methods of estimating risk;
- Allows EPA insufficient time to assess residual risks and revise standards where needed;
- Fails to provide sufficient incentives for existing sources to reduce emissions voluntarily or otherwise, before EPA sets a standard;
- Allows too short a time for EPA or states to complete the large and complex task of reviewing permits;
- Jeopardizes continued operation of existing facilities if EPA misses a regulatory deadline; and
- Dilutes the focus of Section 112 from protection of human health by including environmental effects that are adequately addressed elsewhere in the Act and other statutes.

Provisions of S. 816 that address accidental releases:

- Fail to integrate EPA effort with the important ongoing roles of OSHA, DOT and the Coast Guard;
- Inappropriately impose mandatory legislative requirements for hazard assessment techniques with an unnecessary requirement to update on an arbitrary 2-year schedule; and
- Invite EPA to issue plant design and operation rules that can dangerously interfere with the industry's ability to continuously improve safe design and operation.

S. 1490, a comprehensive Clean Air Act reauthorization bill that contains new air toxic provisions, has many positive elements. However, CMA cannot support the bill as written because it:

- Sets an unnecessarily stringent basis for technology-based standards;
- Fails to provide incentives for early emissions control and actually encourages delay;
- Establishes a cumbersome and wasteful permitting process that jeopardizes continued operation of existing facilities and imposes unreasonable fees; and
- Creates unfair and onerous enforcement provisions that include penalties grossly disproportionate to the offenses involved.

Regarding accidental release provisions of S. 1490:

- An appropriately structured Chemical Safety and Hazards Investigation Board as proposed in S. 1490 could contribute to improved safety and public confidence.

II. INTRODUCTION

Congress should adopt policies that allow the nation to continue to enjoy the benefits chemicals and the chemical industry provide while making continued progress toward a safer environment.

A. CMA member companies recognize their responsibility to manage potentially toxic chemicals safely in order to protect public health and the environment.

CMA member companies recognize their responsibility to manage potentially toxic chemicals to protect the health of workers, consumers, neighbors and the environment. Companies invest real time, talent and resources to control emissions. They try to focus their resources on emissions that pose the highest risks. They expect similar efforts from owners of other emissions sources. CMA believes that new air toxics legislation, if it is reasonable and builds on the foundation of current regulatory and voluntary efforts, can improve the environment while still assuring the continued viability of our industry.

B. Products which use or depend on SARA 313 chemicals are vital to our nation's economy and to the health and welfare of its citizens.

Chemicals that Congress may consider potentially "toxic," such as those on the Superfund Amendments and Reauthorization Act (SARA) Section 313 Toxic Chemical List, are vital to our nation's economy and to the health and well-being of its citizens. Chemicals make possible a vast array of consumer, commercial and industrial goods used in this country and throughout the world. In fact, modern society as we know it would not exist without them. Businesses use chemicals to produce products for our homes and offices, such as appliances, furniture, tools, and computers. Chemicals make possible modern shelter, clothing, transportation systems, and even health care. They have helped produce the healthiest populace with the longest life expectancy of any time in our nation's history.

Congress should recognize the benefits a viable chemical manufacturing industry brings to our country and the world. The chemical industry is the third largest manufacturing industry in the United States and has over 1,000,000 employees. By virtue of its strong exports, the industry helps to offset the nation's serious trade imbalance. As illustrated in Exhibit A, legislation that affects the chemical industry also can affect hundreds-of-thousands of workers and downstream users, and millions of consumers.

III. PROCESS EMISSIONS

As Congress considers amendment to Section 112 of the Clean Air Act, it should recognize the panoply of existing requirements that now control emissions of air toxics.

A. A host of regulatory requirements control air toxics.

The chemical industry currently must comply with a host of environmental, health and safety requirements that control routine process emissions of air toxics. These requirements derive from statutes including:

- the Clean Air Act (CAA),
- the Clean Water Act (CWA),
- the Resource Conservation and Recovery Act (RCRA),
- the Superfund Amendments and Reauthorization Act (SARA),
- the Toxics Substances Control Act (TSCA),
- the Federal Insecticide, Fungicide & Rodenticide Act (FIFRA),
- the Occupational Safety & Health Act (OSHA), and
- many state and local laws.

Even within the Clean Air Act, Section 112 is only one of many provisions controlling emissions by the chemical industry. However, most of these other provisions are not labeled as "air toxics controls," *per se*. These laws and their implementing regulations significantly limit air emissions, both directly and indirectly. Exhibit "B", attached, describes in more detail several of these existing regulatory authorities.

B. The chemical manufacturing industry identifies and communicates information about releases of potentially toxic air pollutants.

In addition to following the extensive regulatory programs described above, our member companies systematically identify and communicate information about releases of potentially toxic air pollutants.

To further the goal of reducing emissions, CMA adopted and carried out an Air Quality Policy early in 1986. That policy calls on member companies voluntarily to:

- (1) identify and quantify both routine emissions and accidental releases;
- (2) determine the impact of those emissions;
- (3) install additional controls, if necessary; and
- (4) communicate their impact and actions openly with the public.

Congress recognized elements of this policy when it enacted the Emergency Planning and Community Right-to-Know Act (EPCRA) law in 1986 (also referred to as Title III of the Superfund Amendments and Reauthorization Act, or SARA Title III). Among other things, SARA Title III requires twenty designated manufacturing industries to determine and report emissions of listed chemicals. The reporting requirement applies only to the industrial manufacturing sectors. Although many other sources emit these same compounds, the regulations did not require them to report.

1. CMA supports full implementation of SARA Title III.

CMA and its member companies are leaders in the implementation of Title III. Our goal is to make the law work at the local level and to encourage full compliance by our member companies. We have undertaken several programs and initiatives that have successfully achieved this goal.

Since passage of SARA Title III, CMA has worked diligently and aggressively with EPA, other national trade associations, affiliated state chemical organizations and our member companies. CMA has informed our employees, our neighbors and our customers about the requirements of Title III. CMA provided aid to others in following the law, and communicated our emissions data and our actions concerning it. Under the Title III program, CMA developed many resource materials, primarily in the form of compliance manuals and workshops, to provide technical support, to educate the public and to aid our members. As a result, we believe that all CMA member companies have reported their emissions faithfully.

2. SARA 313 annual release data, although useful to help set priorities, do not directly translate to public health risk.

The SARA 313 Toxic Release Inventory (TRI) represents annual estimates of emissions of listed chemicals. In many instances these estimates are overstated for a particular facility because of conservative calculation techniques. Nevertheless, data from the initial report show that rather large amounts of the listed chemicals are emitted into the air. Data also show that facilities in the chemical manufacturing Standard Industrial Classification (SIC) codes reported more releases than any other industry. This is hardly surprising since the industry makes and uses most of these substances in much greater quantities than any other reporting industry. The chemical industry recognizes that the reported quantities of air releases in SARA 313 inventories raise fears and questions among the public and others about the risks posed by air pollutants.

The public can easily misunderstand the TRI information. EPA correctly warns there is no direct correlation among pounds of releases, actual exposure, or their effects on the environment or human health. Thus, the raw quantity of emissions, by itself, says little, if anything, about the actual exposure and resulting risk to public health or the environment.

To understand the potential risk to public health of air pollutants, one must correlate the ambient concentrations, the toxicity of the individual substances, and the amount and duration of human exposure. For air releases, one must accurately model or monitor release data, or both, to estimate the concentrations of a substance in the community. Only then can health scientists evaluate potential risks.

The data do not directly correlate to the public exposure and possible health risk. However, TRI release data can be valuable, both nationally and locally, to help public and private entities identify priorities for regulatory review, development, and enforcement. Over time, the data may also track emission trends. However, the present data are of insufficient duration for such analysis.

TRI can help policymakers set national priorities. However, its most effective use is at the local level. EPA and state agencies can use validated TRI data to identify priorities for review, and set strategies for controlling releases of specific substances. Validated TRI data can also help agencies focus on companies, regions, or specific chemical processes of concern for further investigation, enforcement action, or both. Individual companies can use TRI to identify facilities that emit large volumes of substances. They then can set priorities for waste reduction and compare permitted with reported releases.

3. *The chemical industry voluntarily monitors and models air toxic levels to better understand risks.*

Member companies work hard to address public concern over SARA 313 emissions. To help understand how these emissions translate into actual public exposure, some member companies have joined with others to collect ambient air monitoring and modeling data that measure or predict the concentrations of these emitted compounds. One example of such a regional monitoring project is the Houston Regional Monitoring (HRM) program.

HRM, completing its eighth year of continuous operation, is a Texas corporation owned by more than thirty of the companies that it serves. It has successfully operated an ambient air monitoring network in the industrialized area of west Harris County near Houston since 1981.

The HRM program for almost two years has included a long-term community exposure study. HRM measures over 150 volatile organic indicator compounds at sites representative of area air quality around industrial, mobile, and area sources in the Houston area. Ambient air measurements collected as part of the HRM program include 22 of the 34 compounds with the highest total emissions reported under Section 313 of SARA Title III. HRM has found that ambient concentrations of all but a handful of those pollutants were either not present or present in very small (parts per billion) amounts. A panel of industry health professionals received and reviewed the

measurement results. They concluded that the air quality in Houston is similar to other urban areas without Houston's heavy concentration of chemical industries. They also concluded that the measured ambient concentrations do not suggest a significant health risk to the community. Work is continuing to collect additional information.

C. CMA member companies are aggressively reducing releases.

A principal outcome of the process of collecting section 313 data has been to help management focus its attention on both identifying opportunities and setting priorities for pollution prevention or release reduction. While the industry tries to inform the public and assess the utility of the chemical release data, it works hard to actually reduce those emissions, even if there is no evidence of actual adverse impact on public health. By doing so, the industry reduces the opportunity for human exposure and thereby helps bring about an even safer environment.

Chemical manufacturers have undertaken voluntary efforts individually for years. However, CMA's Board of Directors adopted a more formal policy in April 1989 encouraging member companies to strive for continuous improvement in further reducing releases and waste. This policy and accompanying program builds upon CMA's existing Air Quality Policy and waste minimization program.

Under the release reduction policy, each CMA member company will implement actions at the plant level as follows:

- Using the Section 313 list as a starting point, companies inventory their releases to all environmental media;
- Companies set priorities to reduce inventoried releases, based on factors such as the potential health and environmental impact and the level of community exposure; and
- Companies formulate a release reduction plan, and periodically communicate their release reduction progress and future plans to employees and the public.

The policy provides for continuation of the best management practices already in place. By implementing the policy, companies pledge to improve release reduction efforts through focused and collective action. CMA gives technical aid to carry out the policy through handbooks and written materials, periodic workshops, seminars and presentations.

To help member companies carry out the policy, to demonstrate industry leadership, and to respond to what we believe are the public's concerns, the CMA Board of Directors approved three program recommendations. These new elements supplement existing CMA Title III communications and Section 313 database analysis activities. These elements seek to:

- expand regional air quality monitoring and modeling;

- develop clear and widely-accepted scientifically-based methods to evaluate the safety of community exposure levels; and
- provide technical aid to customers and smaller companies to enhance overall environmental, health and safety programs.

As an integral part of this policy, CMA continues to promote practices that protect the safety and health of our employees and residents of communities in which our members operate. Our industry's goal is to assure that releases from our operations do not adversely affect employees, communities, and the environment. The industry encourages others, including our suppliers and customers, to achieve the same goal.

To support the goal CMA has undertaken a new initiative, "Responsible Care: A Public Commitment" to promote continuous improvement in industry management of chemicals and chemical processes. The initiative is directly focused on health, safety and environmental concerns of the public and emphasizes dialogue with the community to identify and respond to those concerns. Participation in Responsible Care has been made an obligation of membership in CMA.

D. CMA supports appropriate changes to Section 112 of the Clean Air Act to further control toxic air pollutants.

As noted above, the chemical industry controls emissions to comply with many existing regulations and also to meet internal company goals. The industry has substantially reduced emissions. As a result of this progress and our belief that Section 112 of the Clean Air Act could work, CMA formerly opposed new air toxic legislation as unnecessary. However, in view of EPA's difficulties in establishing risk-based regulations and the growing public concern about the remaining quantity of air toxics emissions, we have reevaluated our previous position.

After careful evaluation, we now believe that, through a carefully crafted bill, Congress can improve the functioning of the Clean Air Act to provide better control of toxic air pollutants. Our position does not stem from a belief that current emissions of air toxics pose an unreasonable health hazard. Instead, we believe that a reasonable, focused technology-based approach can allow EPA to accelerate the pace of Section 112 emissions control and thus reduce exposure, and therefore potential risks, from releases of toxic pollutants.

1. The risks from industrial air emissions are relatively small.

Before Congress acts to amend Section 112, it should recognize that public health is improving overall. Also, the risks posed by stationary source air emissions are relatively small.

Two studies conducted for the EPA have produced estimates of the number of new cancer cases that result from various air pollutants in our general environment. EPA's 1985 report, "The Air Toxics Problem in the United States: An Analysis of Cancer Risks for Selected Pollutants," estimates that about 1300 to 1700 new cancer cases result annually from carcinogens from both stationary and nonstationary sources. In a more recent report (1987), the EPA examined in detail specific contributions of motor vehicles to cancer. EPA estimated that between 385 and 2,286 new cancers resulted annually from these sources. The total number of cancer cases (excluding non-melanoma skin cancers) that occur annually in this country from all causes is about 850,000. It follows that air pollution's relative contribution from stationary and nonstationary sources to the total cancer burden is small (less than 0.5%), even if one uses the highest EPA figures. In comparison, EPA estimates that passive smoking and indoor radon exposure result annually in up to 5000 and 20,000 cancers, respectively.

Thus, using EPA's estimate, less than 0.5% of these incident cases of cancer may result from the specified toxic air pollutants. Further, EPA attributed most of these cases to non-industrial sources. In its 1985 document "A Strategy to Reduce Risks to Public Health from Air Toxics," EPA states "... several years of experience has led us to conclude that the chemical industry is not the major source of our national air toxics problem...we now estimate that point sources associated with heavy industry (of which chemical manufacture is but a small part) account for only 20-25% of cancer incidence from national air toxics. By comparison, over 50% of our national incidence appears to be due to road vehicles (including gasoline vapors and diesel particulates) and heating sources (including fossil fuel burning, coke ovens, and wood stoves)."

Cancer risks from all sources, except for smoking-related cancers, are actually decreasing. Professor Bruce M. Ames of the Department of Biochemistry of the University of California at Berkeley writes:

Overall, cancer death rates are staying steady or coming down, the major exception being smoking-related cancer. The latest update from the National Cancer Institute (12/01/85) for the decade 1974-1983 shows that cancer of the stomach is down 20%; cancer of the cervix-uterus is down 30% (both of these have been decreasing for decades); and cancer of the ovary is down 8%. The cancer rates that are clearly increasing are lung cancer (up 15%) and female lung cancer (up 75%), both of which are caused by smoking (as is 30% of cancer in the United States); and melanoma (up 20%), which is thought to be due to sunlight exposure.

Life expectancy is steadily increasing in the United States and most industrialized countries (except the U.S.S.R., where male life expectancy has fallen to 62 years); infant mortality is decreasing, and though the statistics are not good on birth defects, there is no evidence that they are increasing overall.

Conclusion. We are the healthiest we have been in human history.

"Six Common Errors Relating to Environmental Pollution," Regulatory Toxicology and Pharmacology, Vol. 7, p. 379 (1987).

Thus, one can conclude from Dr. Ames' findings that our population is becoming increasingly healthier and longer-lived and overall cancer rates are not increasing. However, this does not mean, of course, that environmental pollution does not contribute to the incidence of cancer in the United States. However, that contribution is much less than commonly believed.

In 1981, Sir Richard Doll and Dr. Richard Peto conducted what was probably the most comprehensive study of the causes of cancer in the United States. They reviewed and analyzed massive amounts of information on the causes and origin of cancer. Professors Doll and Peto concluded that use of tobacco accounts for approximately 30 percent of all cancer deaths in the United States, and that dietary factors account for an additional 35 percent. By contrast, they estimated that environmental pollution, of all media (air, water and food supplies combined), accounts for only two percent of all cancers. They attributed the bulk of that two percent to arsenic, asbestos and radioactivity in the air, and chloroform in water. These results are illustrated on Exhibit C, attached.

Other investigators also have had difficulty attributing significant cancer risks to industrial air pollution. For example, Drs. Hammond and Garfinkel of the American Cancer Institute investigated the relative risk of lung cancer mortality in geographic areas grouped according to degree of urbanization and occupational exposure to potential carcinogens. In their study, reported in Volume 9 of Preventive Medicine, Drs. Hammond and Garfinkel found no association between the degree of urbanization and lung cancer mortality, leading them to conclude that air pollution "has very little effect, if any, on the lung cancer death rate."

Professor Ames provides a useful perspective on environmental cancer hazards by comparing such hazards to natural and lifestyle cancer hazards. In an article entitled "Ranking Possible Carcinogenic Hazards," published in the April 17, 1987, issue of Science, Ames observes that general outdoor air pollution appears to be a small risk relative to the pollution inhaled by a smoker. He also calls attention to the important fact that radon, "a natural radioactive gas that is present in the soil [and] gets trapped in house . . . gives rise to radioactive decay products that are known to be carcinogenic for humans." EPA estimates that natural radon pollution in houses may be responsible for up to ten percent of the lung cancer cases in the United States -- that is, an annual cancer incidence as high as 20,000 per year. Thus, natural radon emissions from the rock and soil underlying our homes causes many times the numbers of cancer cases as all man-made toxic air pollutants combined.

Recent studies by the Environmental Protection Agency lead to the same conclusions. EPA carried out an extensive five year experimental study, called the Total Exposure Assessment Monitoring Study, or TEAM. The scientists concluded, contrary to popular belief, that people living in heavily industrialized areas containing petrochemical, paint and plastic processing plants are not subjected to greater exposures to the commonly identified toxic chemicals than are people living in less industrial areas, or even rural areas. A further finding was that people are exposed to far greater concentrations of the chemicals indoors, where people spend most of their time.

This does not mean that the public health and environmental risks associated with toxic air pollutants are of no consequence. But Congress should do nothing to slow the pace or effectiveness of the progress of regulatory agencies and industry, who already are addressing the problem in a variety of ways. Congress should not rush to mandate extreme and disruptive measures when current programs already are producing substantial emission reductions and less onerous control measures can adequately deal with the problem.

2. *Appropriate legislation can improve the current slow pace of regulation of toxic air pollutants by applying sensible controls more widely.*

We recognize that Section 112 of the Clean Air Act has not worked as Congress originally expected. However, EPA's slow progress in promulgating final regulations for pollutants under Section 112 has not been without reason.

Section 112's emphasis is on identification and control of hazardous air pollutants anticipated to cause serious health effects at ambient concentrations. EPA has struggled to determine what pollutants meet the Section 112 definition and to specify the level of control needed to satisfy the statutory requirement of protecting the public with an ample margin of safety. EPA has not regulated many chemicals under Section 112. Often EPA found that additional control under Section 112 was not warranted because risks of many pollutants are sufficiently low, the pollutant sources were already sufficiently regulated under other provisions of the Act, or the benefits of additional control would be too small.

EPA had several National Emission Standards for Hazardous Air Pollutants (NESHAPs) standards underway and finally appeared to be headed in the right direction, albeit slowly, prior to its setback in the Vinyl Chloride Decision. N.R.D.C. v. EPA, 824 F.2d 1146 (D.C. Cir. 1987). This decision forced EPA to reconsider its regulatory approach to 112 standards.

CMA believes that EPA could increase the pace of regulation if Congress amends the law to change the focus of Section 112. Instead of forcing EPA to pursue the perfect "safe" standard for each pollutant, the statute could apply commercially available controls for pollutants of concern as broadly and quickly as possible. CMA believes that such an approach will achieve far more emission reductions in a shorter time.

E. Legislation should direct EPA to establish a reasonable list of toxic air pollutants, based on factors such as toxicity and potential exposure.

A new legislative framework should provide that EPA select for regulation toxic air pollutants which are emitted in sufficient quantities nationally and cause actual exposure to warrant controls. EPA should have the leeway to determine the list of substances, considering such factors as characteristics of the substance, concentrations in the ambient air, exposure, and the significance of the "toxicity" of the substance. The list should contain only those chemicals that likely pose serious adverse human health effects at concentrations that may be found in the ambient air.

There should not be a binding statutory list of substances to be regulated. If Congress includes substances on a list that do not cause harm, EPA and the regulated community will be forced to spend limited resources to develop and implement controls that produce essentially no health benefit. This will drain resources away from implementing controls that will produce health benefits. The statute should provide reasonable procedures for listing and delisting substances to maintain the appropriate focus.

F. Legislation should direct EPA to establish a priority list of source categories for regulation.

After EPA has identified appropriate chemicals for control, EPA should control those sources of air pollutants which have the greatest potential for exposure of the population. When it establishes the list, EPA should consider, at least in a general way, the incremental costs and potential exposure, as well as the environmental impacts resulting from the application of controls. It is more efficient and effective for EPA to develop control standards based on source categories than to develop standards pollutant-by-pollutant.

G. Legislation should direct EPA to establish sensible technology-based standards for source categories that emit significant amounts of listed pollutants.

The stated goal of the Clean Air Act is to protect and enhance the quality of the nation's air resources to promote the health, welfare and productive capacity of its population. We think that air quality is improved most rapidly and effectively by applying commercially available controls on a wide variety of sources which have the highest potential to affect community health and welfare. If legislation prescribes requirements that are unattainable with commercially available controls, EPA will have difficulty promulgating and implementing controls quickly.

The most effective way to get the greatest emission reductions in the shortest period of time is for the law to require practical, commercially-available control technology for a given source category or subcategory. Sources should apply controls to all hazardous air

pollutants emitted from that source above certain quantity thresholds. EPA can promulgate such technology standards much more quickly than chemical-by-chemical standards. For the chemical industry, EPA should evaluate emissions and controls on the basis of a process unit, since it is on that basis that the regulated community plans, constructs and operates facilities and controls.

Adding controls to an existing source is much more difficult and expensive than building controls into new facilities. Thus, legislation should allow different standards for new and existing sources as well as different timetables to implement controls.

H. Legislation should provide flexible control requirements to encourage and support industry control of emissions prior to regulation.

New legislation should encourage and support efforts by industry to achieve reductions before required by regulation. If the legislation establishes rigid and inflexible technological standards, companies will not risk installing controls earlier than required. This is because companies will be uncertain whether EPA will choose a different and perhaps incompatible control level as the final standard. Instead, companies will be forced to wait until the control level is defined. The public is better served when sources implement controls early rather than wait to install a control defined by regulation at a later date, even if the defined control is slightly more stringent. The cumulative air quality benefit depends on total lifetime exposure, and cumulative exposure generally depends more on the timing of controls than on the exact level of reductions. (See Exhibit D)

Technology standards also must allow and encourage technological innovation. The technology standards should set a performance goal and allow companies the flexibility to meet that goal. Without flexibility to demonstrate equivalency, there will be little incentive for innovation. As a result, technology will stagnate. For example, a standard based on a technology of routing vent emissions to a flare should allow equivalent controls through source reduction, such as product substitution or process change. Standards should be flexible enough to allow each facility to control emissions in the most cost-effective manner.

In setting technology standards, EPA should consider other environmental impacts. The reduction of risk in one medium (air) should not come at the price of increased risk in other media, such as water or solid waste.

I. Legislation should provide for implementation and enforcement of EPA-established control requirements through non-redundant state programs.

Congress should design an implementation system to encourage timely and efficient implementation of the standards by new, modified and existing individual sources. The regulatory system should minimize delays caused by agency-decisionmaking bottlenecks, and thus be largely self-implementing. Otherwise, sources and agencies both will be

bogged down in expensive and unproductive administrative activities. The mechanism may include permit, notification, or certification systems, provided that they are designed to minimize delays, administrative costs and overlapping requirements. Wherever possible, the law should allow use of existing enforcement and compliance mechanisms.

States should have full authority for inspection, enforcement and compliance of all standards for toxic air pollutants. The law should avoid creating redundant, overlapping or inconsistent Federal and state substantive and administrative requirements.

Legislation should provide EPA, states and sources adequate time to develop and implement technology and other requirements.

J. Legislation should direct EPA to review residual risk to determine if such risk warrants additional control.

The residual risk review is a two part process. The first step is risk assessment, an evolving science. The second step is to make a policy decision about whether the risks are acceptable.

We believe that a risk evaluation should occur only after sources have fully implemented technology-based standards. In this way, EPA can assess the effectiveness of those controls and consider the actual levels of remaining emissions, exposure and risk. Further control action must focus on real concerns. Current quantitative risk assessment techniques rely on a theoretical calculation, or model, based on numerous assumptions that together can wildly overpredict risks. Risk assessment should not apply safety factors to each variable. The assessment should reflect the most accurate estimation of risk possible. Safety factors should be applied only in the Risk Management stage. As described below, the incorrectly-applied safety assumptions have a vast impact on the results obtained. The entire risk assessment methodology and the way it is applied should be improved and made more realistic before it is used to force sources to cease operations or install controls that are not yet commercially available or economically practical. EPA has recognized the need to revise current risk assessment methodology and all integral components related to risk assessment.^{1/}

1. Current risk assessments use multiple assumptions that can dramatically overstate actual risk estimates.

EPA's current methodology for estimating risk virtually guarantees the exaggeration of actual risks, often by one thousand to ten thousand times. A number of factors or decision points have a very substantial impact on quantitative estimates of risks. Making an overstated choice at any one of these decision points tends to exaggerate the rest. This

^{1/} EPA, Intent-to-Review Guidelines for Carcinogen Risk Assessment, 53 Fed. Reg. 32656, 32657, Col. 3 (Aug. 26, 1988).

exaggeration is then compounded by subsequential calculation, a process known as error propagation. Making overstated choices at every decision point multiplies the effect to produce a wildly inaccurate estimate of risks. For example:

- Using data from the animal species-strain-sex that produced the highest risk of tumors whether or not it is relevant to human toxicology.
- Counting benign as well as malignant tumors in estimating human cancer risks.
- Using surface area, rather than milligram/kilogram body weight/day, produces estimates of risk that are higher.
- Basing risk estimates upon the 95 percent upper confidence limit value of the linearized multi-stage extrapolation model, regardless of whether there are biological data to support the use of such a model for the substance at issue.
- Using extreme assumptions that artificially inflate predicted maximum individual risk exposures attributable to emissions from any source. In particular:
 - a facility operates continuously for seventy years (despite operational life of source equipment that usually is closer to twenty years).
 - individuals actually reside at the point where the annual average modeled concentration of emissions from the source is highest (or 200 meters from the process location).
 - person or persons residing at the point of maximum annual average concentration remain totally immobile for a lifetime, never moving to another residence and never leaving home.
 - the maximum exposed individual spends all of his time at the point where pollutant levels from the source are highest (or 200 meters from the process location).
- a. Choice of the animal data set used for the purposes of estimating human risks often contributes to inaccuracies.

EPA uses data from the animal species-strain-sex that produced the highest rate of tumors whether or not it is relevant to potential human health risk. That approach greatly exaggerates any human cancer risk, particularly when a lower tumor incidence has been found in species having pharmacokinetic, i.e., absorption, distribution, metabolism and excretion, processes that more closely parallel those found in humans.

- b. A decision on whether to count benign as well as malignant tumors in estimating human cancer risks biases the data causing error.

EPA typically combines benign (non-cancerous) with malignant (cancerous) tumors, "unless there is evidence against the progression of benign lesions to corresponding malignancies." This practice amounts to a requirement of "negative evidence before EPA decides not to combine tumors." However, as scientists have pointed out, most benign tumors never become malignant, so this procedure almost always overstates human risks.

- c. The choice of an interspecies scaling factor is erroneously stringent.

In performing a risk assessment on the basis of animal data, EPA uses surface area, rather than body weight, as the basis for extrapolation from animals to man. Use of surface area, rather than milligram/kilogram body weight/day, produces estimates of risks that are higher by approximately six or seven times in the case of rats and twelve or thirteen or more times in the case of mice.^{2/} Although not free from doubt, most evidence suggests that, for most compounds, an interspecies scaling factor based on milligram/kilogram body weight/day predicts cancer risk to humans more accurately than a surface-area scaling factor.

- d. The choice of a high-dose to a low-dose extrapolation model errs by overestimating risk.

EPA insures additional inaccuracy by basing risk estimates upon the 95 percent upper confidence limit value of the linearized multi-stage extrapolation model, regardless of whether biological data support such a model for the substance at issue. The approach is wrong in two respects: first, it presumes low dose linearity rather than some more realistic non-linear response; second, it uses the 95 percent upper-confidence level rather than the maximum likelihood estimate or central estimate of risk. The resulting estimate, as EPA acknowledges, is at best "a plausible upper limit to the risk," rather than a "realistic prediction of the risk," which could be "as low as zero."^{3/} As the Food and Drug Administration has observed, rather than predicting what actually will occur, a conservative model like the linearized multi-staged model predicts "with reasonable certainty . . . what will not occur."^{4/}

^{2/} See 53 Fed. Reg. at 32657, Col. 2.

^{3/} 57 Fed. Reg. 33998, Col. 1 (Sept. 24, 1986).

^{4/} 46 Fed. Reg. 15500, 15501 (1981) (emphasis supplied).

e. The choice of exposure assumptions often is far overstated and misleading.

EPA's risk assessments often contain extreme assumptions that artificially inflate predicted maximum individual risk exposures attributable to emissions from any source. In particular:

EPA assumes a facility operates continuously for seventy years, despite operational life of source equipment that usually is closer to twenty years.

EPA appears to assume that all exposed individuals actually reside at the point where the annual average modeled concentration of emissions from the source is highest (or 200 meters from the process location).

EPA assumes that the person or persons residing at the point of maximum annual average concentration remain totally immobile for a lifetime, never moving to another residence and never leaving their front porch.

EPA assumes that the maximum exposed individual spends all of his time at the point where pollutant levels from the source are highest (or 200 meters from the process location).

In essence, the risk assessments are based on the premise that individuals are born and die at the point of maximum pollution concentration and never leave that spot, even to go to work or school. These are unrealistic assumptions that can cause EPA to overestimate actual risks by several orders of magnitude.

Clearly, quantitative estimates of risk can vary from real risks by an extremely wide margin, and thus should not be relied on as either precise or accurate. CMA supports properly done risk assessments based on the best estimates for exposure and the most plausible toxic mechanisms.

2. Legislation should require an independent scientific body to develop improved, more accurate risk assessments.

We know that scientists are improving their understanding and calculation of potential risk. As our understanding of risk and risk assessment grows, we expect that different and more accurate assumptions will emerge. Also, as EPA recognizes in its Guidelines for Carcinogenic Risk Assessment, "knowledge about carcinogenesis is progressing at a rapid rate . . . [EPA] recommends that the Guidelines be revised as often as warranted by advances in the field."^{2/} EPA is already working to review and revise its guidelines.^{3/}

^{2/} 51 Fed. Reg. 34002 (Sept. 24, 1986).

^{3/} 53 Fed. Reg. 32657 (Aug. 6, 1988).

Legislation must not freeze development of better science by mandating use of the present faulty methodology. Thus, legislation should not specify a particular methodology. Legislation should require an appropriate independent scientific body to develop and improve such methodology in a credible manner, based on scientifically-sound principles.

3. Risk assessments should include a number of relevant parameters.

The criteria for determining the risk to human health from carcinogens should consider both the maximum-exposed individual and the general population at risk. In addition, risk assessments should include, and decisionmakers should rely on, a variety of factors that provide added perspective on predicted risk numbers. These factors include risk distribution among the exposed population, i.e., maximum individual risk and annual incidence, the uncertainty of the assumptions, the amount and quality of the data, the benefit of the activity creating the risk, and whether the risk-creating activity is being operated in a reasonably prudent manner.

Maximum Individual Risk (MIR) or Annual Incidence alone provides only part of the measure of public health risk. As noted above, EPA's MIR risk estimates can be greatly exaggerated, and full of uncertainties. If one relies solely on MIR, without considering the distribution of risk on the exposed population, one can get an extremely distorted picture of the overall risks to public health, which the Clean Air Act is intended to protect. If EPA must rely solely on an MIR value, EPA will be forced to make arbitrary and inappropriate regulatory decisions for an entire source category based on unrepresentative emissions modeling results.

It would equally be a mistake to force EPA to rely solely on annual incidence values. The incidence value depends to a great extent on the size or inclusiveness of the category involved. As a result, a higher incidence value would be expected in the case of a source category that is defined to include many sources (so that large numbers of people are exposed) than in the case of a source category that is defined to include very few sources (so that relatively few people are exposed). Because the definition of the source category depends more on similarities in the process involved and available control techniques than on evaluations of risk, incidence values alone can be very deceptive. They can create a misleading impression about the relative risks associated with different source categories. Thus, although the incidence value is a relevant factor, it, too, should not solely determine acceptable risk.

The government should not use any single parameter of risk in isolation to force particular risk management actions. In addition, Congress should not attempt to separate these parameters of risk from the judgment of the underlying data and assumptions. As EPA acknowledges in its Guidelines for Carcinogenic Risk Assessment: "[I]t is critical that the numerical estimates not be allowed to stand alone, separated from the various

assumptions and uncertainties upon which they are bound.^{2/} Risk methodology should consider the quality of the data base, weight of the evidence, human experience with the chemical, and other relevant factors.

4. Risk assessments should recognize valid distinctions based on the weight of evidence of carcinogenicity.

Risk assessment methodology should recognize the difference between proven human carcinogens and those chemicals for which there is only laboratory animal evidence. Some pollutants are likely to be toxic only above threshold concentrations. Researchers have shown that animal evidence for other pollutants is not relevant in humans. The government should treat these pollutants differently from those substances that are proven human carcinogens. Risk assessments should also recognize the difference between substances whose impact on health is supported by actual data and other substances for which the only health information is a theoretical model.

5. Risk management decisions should take into account inherent limitations of risk assessment techniques.

Risk assessment is only one tool of risk management. The risk methodology is simply inadequate for Congress to set a specific risk number that can never be exceeded. Congress should not enact a statute that will force plants to close and will throw workers off their jobs based on some theoretical, speculative, and highly-conservative "assumption" about risk. Legislation should be aimed at reducing real risks posed by real emissions and real exposure in actual site-specific conditions. Congress should not force EPA to set standards so high that society incurs enormous losses, including real adverse health impacts from plant shutdowns, in an attempt to eliminate very small hypothetical risks.

If EPA determines that residual risks are unacceptably high, it should be able to require sources to install additional controls on a reasonable schedule. The schedule should take into account the availability of technology and relevant site-specific factors. Individual sources should be able to perform the risk analysis to show compliance with a risk standard. Such an evaluation should consider the actual level of emissions and exposure conditions after the application of technology-based controls.

^{2/} Id.

K. Although the process emission sections in S. 816 include some positive elements, it contains too many harmful provisions.

S. 816 follows the general framework CMA supports: technology-based standards followed by later evaluation of residual risk. However, the bill is unreasonable because it requires extremely stringent controls without any demonstrated corresponding improvements in public health.

1. Definitions

a. "Major Source"

A major source is defined in the bill to include all emission points and units within a contiguous area, under common control, emitting more than 10 metric tons per year of a single listed pollutant or 25 metric tons per year of any combination of listed pollutants. The scope of this definition is inconsistent with an effective, efficient approach to control of air toxics.

Many chemical manufacturing facilities are extremely large, often covering thousands of acres incorporating many independent units that use and produce chemicals in a wide variety of processes and equipment. While all the process units within a facility may be owned by the same parent, they frequently are operated as independent business entities. EPA cannot logically consider all these diverse units as a single "major source" when it develops regulations for the chemical process industry. There is no rational reason for grouping different types of process units into a single "major source" simply because such units happen to be close to each other and owned by the same company.

The trigger levels of 10 and 25 metric tons are much too low. Many sources of chemicals emitted in these amounts pose no significant risk to public health. Legislation that forces EPA to regulate insignificant sources will only waste resources and divert attention away from real problems. EPA should focus its regulatory attention where it will achieve the most benefit. There is no reason to believe that EPA must regulate every source this small to protect public health. Therefore, EPA should be given discretion to adjust this trigger level upward in appropriate circumstances.

b. "New Source"

The bill defines a new source as a source for which construction is commenced after a rule is proposed. This definition is drawn from New Source Performance Standards (NSPS) rules which are applicable only to new sources. However, these same rules need not apply under Section 112 since Section 112 standards will apply to new and existing sources. Frequently, a final rule, which often is promulgated several months or even years after proposal, will differ significantly from a proposed rule. If the final rule

differs from the proposal, a source that acts in good faith and complies with the proposed rule may be forced to redesign or install different controls at significant additional cost.

A new source thus should be defined as a source for which construction is commenced after a final standard is promulgated. Any source that begins construction prior to promulgation should be regulated as an existing source.

2. List of Pollutants

It is impossible to offer specific comments on the list of pollutants referred to in the bill because those chemicals have not yet been identified. However, CMA believes that Section 112 of the Clean Air Act should address only those substances known to cause serious, adverse human health effects. Emissions that may produce adverse environmental effects are better controlled through other sections of the Act (such as Sections 108, 109, or 111) or other statutes, which already include adequate authority. Also, substances that cause acute adverse effects on human health should not be regulated in the same way as those which may cause chronic effects.

It is important that the Administrator be committed to a fair and efficient system for reviewing listing and delisting petitions. This bill, however, appears to make it far harder to remove a substance from the list than to add one; it may even make delisting virtually impossible.

The Administrator must have discretion to judge all the information available. He should not be forced to list pollutants for which there is insufficient information. However, when information is not available, the Administrator can and should first gather any necessary information using existing authorities.

3. List of Source Categories

CMA strongly supports the bill's requirement that the list of source categories and subcategories be subject to notice and comment rulemaking and also supports the designation of minimum emission rates based on the characteristics of each substance. However, CMA disagrees that every source emitting more than the minimum emission rate must be subject to regulation.

It is wasteful and counterproductive for the bill to require EPA to regulate all source categories without exception. Source categories that do not cause public exposure to harmful ambient concentrations of a listed substance should not be regulated under Section 112. The law should provide the Administrator with the flexibility to determine which source categories merit regulation and which do not.

4. Emission Standards

The bill requires the Administrator to promulgate emissions standards for every listed source category or subcategory. The bill does not require that a source category pose any significant risk to public health. The bill gives the Administrator almost no flexibility in setting the actual standards since the cost and technical feasibility considerations included in (d)(2) seem to be overridden by the absolute control requirements in (d)(3). For new sources, the standard must be at least as stringent as the most stringent level of control achieved by any source in the same category or subcategory. Standards for existing sources are only slightly less onerous.

The technology-based standards should be based on commercially available controls that can be quickly implemented. Since most controls will be installed on existing facilities, the cost and feasibility of retrofitting must be considered along with the benefits of additional control. These factors must be considered in addition to those factors identified in (d)(2).

The large number of substances and sources that the bill regulates pose varying degrees of risk. It is inappropriate for the bill to treat every substance and every source in the same way. The technology-based standard can be flexible without undue risk to human health. EPA can control residual public health risks, if any, by the second, risk-based evaluation. For some sources and substances, the most stringent level of control may be appropriate. However, for others, controls could impose substantial hardship with essentially no public health benefit. It is wasteful and counterproductive for the law to require the same control on all sources and substances, simply for the sake of control.

5. Schedule for Standards and Review

CMA agrees that the Administrator should set priorities for regulation of categories and subcategories and the criteria in the bill are acceptable. Further, CMA agrees that the Administrator should publish a proposed schedule for development of regulations, but we doubt whether the strict schedule in the bill can be met.

The bill identifies the first categories for which EPA must develop standards by reference to a list of specific pollutants. This may be an attempt by the authors to allow EPA to start with the Hazardous Organic NESHAP (HON) source categories, for which the Agency has already completed substantial work. However, the HON, unlike this bill, did not propose regulation of all source categories of each listed substance. If the intent of the bill is to start where work is already well under way, then the bill should identify the specific source categories included in the HON rather than refer to a list of substances.

The Agency and affected sources need more than five years after initial promulgation of emission standards to reevaluate every regulated source category, determine if additional control is necessary, and develop new risk-based standards. A facility may still be installing controls to comply with the technology-based standards. Congress should require EPA to take into account the effectiveness of the first phase of controls and any other changes before developing a second set of requirements for the same sources.

Given the uncertainties of present risk assessment techniques, CMA strongly disagrees with the language of the bill that indicates that no risk greater than a maximum individual risk of one in one million will ever be acceptable. The bill further complicates this issue by providing for the evaluation of risks from a stream of pollutants as well as risks from any individual pollutant. As discussed in more detail in other sections of this statement, CMA opposes any bright-line approach for defining acceptable risks as bad science and bad policy.

6. Additional Regulation of Carcinogens

The bill treats all known, probable, or possible carcinogens equally. Under the Agency's categorization scheme, substances are regulated as carcinogens even where no evidence of human carcinogenicity exists. Those substances should be treated differently from substances for which there is strong evidence of human carcinogenicity.

Like the previous section of the bill, this section refers to risks from a single pollutant or "a stream of pollutants." It is unclear how EPA intends to quantify risks from combinations of pollutants emitted from a single source.

Because the consequences of failure to meet these standards are so severe, it is unreasonable for EPA to ignore technological feasibility when it develops any emissions standards, including those for carcinogens.

7. Standards to Protect Health and the Environment

The bill prohibits the consideration of cost or other factors in setting risk-based standards with an ample margin of safety for non-carcinogens. CMA strongly believes these factors should be considered. This is especially true with regard to the margin of safety, as indicated by the U. S. Court of Appeals for the D. C. Circuit in the Vinyl Chloride decision.

Section 112 of the Clean Air Act is not designed to regulate environmental effects. Congress should limit regulation under Section 112 to those substances that have an adverse effect on human health. Other provisions of the Act are more appropriate to address non-health environmental concerns. CMA believes Section 112 should be focused on human health. Adverse environmental effects should be regulated under the "public welfare" authority found in other sections of the Act. For example, section 108 authorizes

the establishment of national ambient air quality standards for any pollutant; and Section 111 authorizes the regulation of sources that are determined to endanger public health or welfare. In addition to the Clean Air Act, mercury and PCBs are subject to regulation under the Resource Conservation and Recovery Act (RCRA) and the Toxic Substances Control Act (TSCA). These non-health concerns should not be an additional consideration in setting risk-based standards. This is another example where the bill fails to focus resources and efforts on solving the most important problems.

8. Work Practice Standards and Other Requirements

The bill authorizes the Administrator to promulgate work practice or operational standards in addition to any numerical emissions limitation. The Administrator should have flexibility to promulgate a work practice or operational standard instead of a numerical emissions limit whenever such a standard is necessary. In many instances, it will be impossible for anyone to measure and determine compliance with numerical limitations because the projected emissions will be much smaller than our ability to measure. In those instances, it is much more appropriate to design an alternative approach that EPA and sources can agree accomplishes the same result.

CMA supports the concept of alternative emissions limitations. We disagree, however, that public notice and comment is needed for every request. The Administrator or a State permitting agency will have sufficient information to determine the effectiveness of any proposed alternative, and the statute should authorize them to make such a determination without delay.

The bill authorizes the Administrator to require each source to carry out an annual audit and safety inspection. CMA does not object to this requirement to the extent the inspections are reasonable. However, we object strongly to any possibility of disclosure of information that may be proprietary or confidential. The bill should give adequate protection to confidential business information to encourage the most effective results.

9. Schedule for Compliance

CMA supports the compliance schedules described in the bill. However, because the bill will trigger an unprecedented amount of control activity, CMA encourages a reasonable interpretation of conditions for an extension or exception from residual risk standards, if a source has acted in good faith. The Administrator should have some flexibility to determine the appropriate schedule for compliance. Once a source submits a request for an exception, the Administrator should review and act on the request promptly. If EPA grants a State the authority to review requests for exceptions, the Administrator should not have the authority to veto the decision made by the State.

10. Incentives for Early Control.

CMA believes that incentives for early control can yield significant air quality and economic benefits. These benefits cannot be fully realized given the present structure of this bill.

The bill allows the Administrator to exempt a source from the technology standards if the source has reduced emissions by 90 percent between 1985 and the end of 1992. CMA believes that if a source can make the appropriate demonstration, the bill should require the Administrator to grant an exemption.

In addition, to encourage early reductions, the bill should exempt any source that has achieved a 90 percent reduction, whether or not such reduction is completely voluntary.

The bill allows a source that has installed control technology to meet RACT, BACT, or LAER a period of five years from the date of installation to comply with a new standard. Since it will be a number of years before most standards are adopted and sources may have three years to implement controls, this time period represents no real benefit or incentive. To be meaningful, the time period for compliance should start five years after the date the source otherwise would have to comply with the new regulations.

CMA agrees with the provision that allows for a site specific waiver of requirements for an individual pollutant if the source can demonstrate that emissions do not present a significant risk of adverse human health effects or environmental effects. The bill provides that applications for waivers deemed incomplete must be denied, with no opportunity for reapplication. This result is unreasonably harsh if the source acts in good faith and submits an apparently complete application. The Administrator should, at a minimum, inform the source of the information still needed. Only if the source fails to furnish reasonably-requested information in a timely manner should the Administrator deny the application.

11. Permit Program

The bill requires that any source subject to a Section 112 standard must apply for and receive a permit. This requirement becomes effective immediately upon enactment. However, the bill preserves a number of existing standards. Thus, all sources subject to those standards will be in violation on the date of enactment.

The bill attempts to solve this problem by providing for temporary operating permits based on self-certification. CMA strongly supports this approach and believes it could be expanded to replace the permit requirement altogether.

One of the most serious concerns with the permitting requirement is that if the Administrator fails to promulgate a standard according to the schedule in the bill, a

source subject to the standard has six months to receive a permit or it must cease operation. This provision is unfair, unreasonable and unworkable and should be deleted. It will simply punish sources for EPA's failure to act. The result will be chaos. While CMA agrees that EPA should have incentives to meet its deadlines, this proposal is totally inappropriate.

Under the bill, the Administrator must issue guidance for permit programs. The guidance must require that the permitting agency provide public notice and an opportunity for public hearing on every permit application. A state must also ensure that it will issue no permit if the Administrator timely objects. CMA does not object to reasonable public notice. However, the permitting agency must have more discretion to establish the appropriate level of public involvement. CMA believes that continuous oversight by the Administrator once a state has been delegated permitting authority is wasteful and duplicative. Further, it intrudes on appropriate state responsibilities.

The bill allows EPA sixty days to review every permit application in states that have permitting authority. There is no need for EPA to maintain this intrusive level of oversight, especially once a state has an approved program. If the state fails to carry out its program, EPA should pull the state's delegation. Otherwise, the state should have the latitude to make its own decisions without EPA second-guessing.

12. Area Source Program

CMA supports the study, and regulation when appropriate, of area sources. CMA supports improved ambient air monitoring, as the bill requires. CMA notes, however, that valid techniques may not exist to determine the precise source of any emissions detected by ambient monitoring.

13. State Programs

CMA agrees that states should administer the permit program. It is appropriate for each state to determine, on its own, what portions of the program it wants to administer. We agree that EPA should periodically audit state programs. In the event that a state is not properly administering the program, EPA should revoke the state's delegation, not enforce against individual sources.

14. Savings Clause

CMA agrees that the bill should preserve those regulatory decisions EPA has made under the existing Section 112.

15. Study of Risk Assessment

CMA supports a review and evaluation of risk assessment techniques. However, twenty-four months may not be enough time for EPA to conduct a serious review. It certainly is not enough time to improve existing techniques significantly. An independent scientific organization, such as the National Institutes of Health or the National Academy of Science, should have a key role in the review and any recommended methodology should be subject to independent peer review.

L. CMA believes that S. 1490 contains both beneficial and objectionable provisions.

S. 1490 regulates air toxics in two phases: technology-based standards followed by an evaluation of residual risk. Unlike other bills, S. 1490 creates a totally new comprehensive permitting system. The permit program is far too complex and burdensome to be effective. Further, the bill contains onerous enforcement provisions in Title VI. The enforcement provisions depart significantly from existing practice and other environmental laws. CMA believes the enforcement authorities are oppressive, unfair and unwarranted.

In addition, the bill severely limits the right of any party to challenge decisions of the Administrator at many crucial stages of regulatory development. While it may be appropriate to minimize legal challenges, it is unreasonable, unfair and counterproductive to completely eliminate the ability of a source or group of sources to obtain court review of EPA's decisions.

1. Title III--Air Toxics

a. Definitions

(i) "Major Source"

The bill defines a "major source" as a single source or group of sources within a contiguous area and under common control that emits more than stated amounts of listed pollutants, individually and in combination. The bill fails to recognize that chemical manufacturing facilities may include a number of diverse, independent operating units within a single fence line. The bill should not combine all these different sources and treat them as a single entity when it develops regulation. The definition of "source" should be the "process unit" for chemical manufacturing plants. A process unit is one or more units of processing equipment which may be operated independently of other parts of the facility. It is far more efficient for EPA to write regulations to address similar manufacturing operations than to try to regulate a myriad of chemical operations at once simply because they happen to be in close proximity.

(ii) "New Source"

A "new source," according to the language of the bill, is one for which construction or reconstruction is commenced after a regulation is proposed. Any source that builds after proposal but before promulgation of the final rule take the significant risk that the requirements will differ from the final rule. If so, the source may inadvertently violate the standard and be forced to significantly modify its project. This is neither fair nor justified, particularly since existing sources also are subject to controls. Congress should define a source as "new" only if the source commences construction after a rule is promulgated. EPA should regulate other sources as existing sources.

b. Hazardous Air Pollutants List

Section 112 of the Clean Air Act should address only those pollutants that adversely affect human health. The list in S. 1490 contains many substances that do not meet this criteria. For example, the bill includes all compounds of manganese, many of which are in medicines and vitamins. All glycol ethers are included on the list, though only four glycol ethers have been judged to present adverse health effects by OSHA and the California Proposition 65 Scientific Advisory Panel.

The law should direct EPA to review the entire list and identify those individual substances within each category of compounds that meet the listing criteria. Many individual compounds in these categories do not meet the criteria and should not be regulated.

The bill adds substances to the list if EPA finds acute adverse human health effects. However, Section 112 of the Act is designed to deal with long term exposures. The law should not attempt to regulate acute toxins in the same manner as chronic toxins.

The bill prohibits EPA from including on the list of hazardous air pollutants any pollutant listed under Section 108(a). This prohibition should extend to precursors of pollutants listed under 108(a), unless the precursor itself is shown to have direct human health effects.

c. Source Category List

The Administrator must publish, within twelve months of enactment, a list of all source categories and subcategories designated for regulation. The law should require EPA to give notice and solicit public comment by rulemaking when it lists and designates source categories. The Agency often does not maintain the most current information about emissions from a particular source category. The public should have an opportunity to provide additional information. This information may help the Administrator determine where to focus resources to accomplish the most beneficial emission reductions.

CMA agrees that the bill should provide the Administrator with considerable flexibility to identify which categories merit regulation and which categories already are adequately controlled. However, CMA believes EPA should not reevaluate those source categories already regulated under the existing Section 112.

d. Level of Control--Maximum Achievable Control Technology Standards.

The bill appropriately provides the Administrator flexibility to develop standards that distinguish between classes, types, and sizes of sources. EPA may subject new and existing sources to different standards. Even with these distinctions, however, the standards

described in the bill are far more stringent than is reasonable or necessary. For new sources, the bill requires the standard to be no less stringent than the single most stringently controlled similar source. For existing sources, the standard may be slightly less stringent. This effectively eliminates any differences between sources that may present risks to public health and sources whose risks are minimal or non-existent. The Administrator needs more flexibility to identify the appropriate level of control.

e. Schedule for Standards

The schedule for promulgation of standards is tight. Given the magnitude of the regulatory tasks, CMA agrees that EPA should set priorities for its efforts using the criteria in the bill.

f. Unreasonable Risk Evaluation

CMA agrees that the Administrator needs the flexibility provided to determine what level of risk is unreasonable for a particular chemical, source, or source category. An independent, scientific organization should be identified to assist the Administrator in reviewing and periodically updating risk assessment techniques.

g. Alternative Emissions Limitations

CMA strongly supports the concept of alternative limitations, since they can significantly improve air quality and provide economical benefits. Granting such early reduction credits should be non-discretionary, so that if the source meets the necessary demonstrations, then credits should be granted by an authorized permitting agency. Credit should also be granted for sources which employ pollution prevention or source reduction activities, as well as reductions based upon EPA-approved emission factors.

If a source meets and demonstrates that its emissions present a negligible risk to public health, that source should be exempt from both the technology and residual risk standards.

A source which achieves early emissions reductions prior to promulgation of MACT (whether done voluntarily or as a result of an action required by a Federal, state or local agency in response to some other Clean Air Act provision) should be granted equivalency to MACT if one of the three following criteria are met:

- (a) it achieves an emissions level at least equal to 90 percent removal from uncontrolled emissions;
- (b) it achieves an emissions level equivalent to that expected with LAER; or
- (c) its emissions are within ten percent of the level to be achieved by MACT.

Any source which carries out an early emissions reduction program, but does not attain the levels to qualify its emissions for equivalency with MACT, should be allowed an extension for MACT compliance, where such extension is proportional to the degree of reduction obtained and the time it is achieved prior to MACT promulgation.

h. Savings Provision

The law should preserve under the new Section 112 those standards promulgated under the existing Act. EPA set those standards considering risks to public health. Therefore, Congress should exempt those source categories from further review.

2. Title IV-Permits

a. Definitions

Title IV of the bill, like Title III, defines a major source to include all units within a contiguous area and under common control. This definition is often too broad for this application, as it is in Title III. Permits and standards should generally be based on the process unit level, not combinations of process units.

b. Permit Programs

Title IV sets up a huge, burdensome and wasteful permit program to replace existing state programs which generally are working well. In addition, the program includes administrative and procedural steps that would needlessly hinder timely issuance of permits and the continued operation of existing facilities. It will create a flood of paperwork rather than focus on emission reductions.

CMA believes the existing state permitting programs should not be disrupted in this way. A much simplified permitting or certification process should be provided. The certification process currently used in Section 112 works well. It allows sources to concentrate on compliance and states to concentrate on inspections and confirmation of compliance activities.

The bill recognizes that it will take time for new permitting programs to become operational. Unlike the absurd requirement of other proposals, this bill does not require a source to have a permit before the permitting program is in operation. The bill also sensibly recognizes that there may be some source categories that should not be required to get permits. Thus, the bill allows the Administrator to provide exemptions.

The bill provides for the collection of excessive permit fees that are designated to fund overly broad state programs. CMA does not oppose fees to fund the permit program, but strongly opposes the funding of other programs as provided in the bill.

There is practically no limit to the funds that could be expended on guidelines, development, monitoring and modeling, and such efforts should compete for funds on their merits rather than being funded without limit from permit fees that have no ceiling. Programs that have no budgetary constraints are bound to be wasteful.

The bill requires states to increase fees every year based only on the Consumer Price Index. States should not raise fees absent a demonstration of need.

If the Administrator determines that a state is not adequately administering or enforcing a fee program, the Administrator may take a variety of actions. One of these actions is the direct collection of fees. However, the bill does not preclude the source from being forced to pay a fee to the state as well. The law should not impose a double fee on a source because of a disagreement between the state and EPA.

To be approved under this bill, the state program must show adequate authority to issue permits for a fixed term, not to exceed five years. CMA believes that once a source successfully completes the permit process, the permit should not be changed for at least five years. The only exceptions would be where changes are needed to correct misrepresentation, mutual mistake of fact, or physical or operational changes at the source. EPA should issue permits for individual process units. If so, there is less likelihood that EPA or sources will need to reopen permits later.

Under the bill, the State must show adequate authority to recover civil penalties of not less than \$10,000 per day for each violation, and appropriate criminal penalties. However, the bill also allows the United States to retain authority to enforce permit requirements under Title VI. Thus, the bill need not force states to have comparable penalty authority. Each state should demonstrate that it can enforce permits, but each state should be free to accomplish that goal as it sees fit.

The bill requires all states to accept delegation of the entire permitting program. Based on experience under the current Act and other environmental statutes, we believe some states may prefer not to have permitting authority. States should have that option. Unfortunately, the bill appears to punish individual sources within a state, as well as the state itself, if the state fails to submit an approvable permit program.

The continued heavy federal oversight of state actions--even after delegation of authority to the state--is unnecessary. It would further complicate and delay the compliance process. CMA believes that after delegation the states should have sole authority to make day-to-day decisions on permit issues. EPA's role should be to audit state programs. This approach would be consistent with delegation authority which functions satisfactorily under other provisions of this and other environmental statutes.

The bill does provide for EPA oversight of state implementation of the permitting program. However, if EPA finds the program is deficient, the bill unfairly provides for

sanctions against stationary sources in that state. CMA believes that, under some conditions, the delegation of authority could be rescinded, but that sanctions against sources are unfair and should be eliminated.

c. Permit Applications

According to the bill, a source must submit a compliance plan with its permit application. The bill is flawed because it fails to provide protection for confidential business information or trade secrets in either the application or the plan. The technology or techniques a particular source uses to control emissions may involve proprietary processes. The bill should protect all proprietary and trade secret information from disclosure.

In addition to submitting a compliance plan, each source must also submit a periodic certification of compliance. Sources are required to report promptly any "violation." However, whether particular emissions constitute a "violation" is a determination of law, not fact. Further, this appears to be a blatant attempt to force persons to give up their rights to avoid self-incrimination.

Within six months of becoming subject to permit requirements, a source must prepare and submit a permit application. However, these applications are likely to be very complex and time consuming. They are likely to vary substantially from permit applications under current law. Sources sometimes will need more than six months to prepare and submit complete permit applications.

Under the bill, if a source submits a complete permit application, the source may continue to operate while the application is undergoing review. However, the bill takes away this option for any new source required to get a construction permit under sections 165, 172, or 173. To make matters worse, the bill does not require the permitting agency to provide timely notice to the applicant that its permit application is complete.

CMA supports the provision that allows for the continued operation of existing facilities upon submittal of a complete permit application. However, we are seriously concerned that under this bill a subsequent determination that the application is incomplete for any reason would unfairly jeopardize continued operation of that source. CMA believes that there must be a provision to enable operations to continue while EPA notifies the source of additional information that is needed and allows the source a reasonable response time.

d. Permit Requirements and Conditions

The bill allows the permitting authority, after public notice, to issue general permits covering numerous similar sources. This provision is good. It can eliminate the extremely burdensome permitting requirements for a number of small sources. Similarly, the bill allows EPA to issue a single permit for similar operations at multiple temporary locations. This provision could beneficially streamline the permit system.

e. Permit Review Procedures

The bill provides a level of EPA over- over a state with an approved permitting program that is oppressive and unnecessary. The bill requires the permitting authority to transmit to the Administrator a copy of every permit application and compliance plan. The Administrator has ninety days to review the application to determine its acceptability. If the Administrator objects to any application, the permitting authority must submit a revised application within ninety days or the Administrator will take action on the application directly.

Delay will be worsened by the bill's requirement that the permitting agency send copies of permit applications and draft permits to the Governor of each state contiguous to the state where the source is located. The permit application already will be public information. There is no reason to provide a special review for any particular entity. If the Governor of any contiguous state is interested in a particular permit in another state, he should participate in the public review process open to everyone.

If the Administrator, in spite of all his involvement before a permit is issued, determines later that the permit should be terminated, modified, or revoked, he must notify the permitting agency. If the permitting agency does not take action within ninety days to terminate, modify, or revoke the permit, then the Administrator will take such action directly.

3. Title VI--Enforcement

CMA agrees that the Clean Air Act, like other environmental laws, should be vigorously enforced. Those companies that spend the time and money to comply expect the government to ensure that others will do likewise. However, Title VI of S. 1490 is an overreaching expansion of enforcement powers of the United States. These provisions go beyond what is necessary to assure compliance. The bill establishes enormous potential criminal liability for conduct that is vaguely defined. Even the most minor recordkeeping errors could be subject to severe criminal penalties. This title should be carefully reconsidered by Congress and the title should be revised to be less unfair, oppressive and open to prosecutorial abuse.

a. Notifications and Compliance Orders

Under the present Act, when the Administrator determines that a source is in violation of a State Implementation Plan (SIP) the Administrator gives notice to both the State and the source. Before any further legal action can be taken, the parties have thirty days to determine if a violation indeed exists and, if so, to resolve the problem. This system helps resolve many enforcement cases promptly and without unnecessary litigation. Under this bill, however, this thirty-day notice is eliminated for most violations.

b. Criminal Enforcement

The criminal enforcement provisions of Title VI contain the most graphic examples of penalties that far exceed those found in any other environmental statute. Penalties simply are out of proportion to the seriousness of the act. For example, any person who fails to pay a fee on time may be subject to a criminal fine as well as imprisonment for a year for each day the payment is late.

The bill creates criminal liability for any person who negligently releases air pollutants that may place someone in danger. No harm need occur. The release need not be intentional. However, in addition to criminal fines, a person convicted of negligent endangerment may be imprisoned for one year per day the release occurred.

Any person who knowingly violates any requirement of Titles I, III, IV or V is liable for a fine and imprisonment of up to five years per day for each violation. No other environmental statute applies maximum imprisonment terms on a per-day basis.

Any person who omits material information from a permit application may face imprisonment for up to two years for each day the omission continued.

The bill creates a new crime of knowing endangerment, which results from a knowing release of air pollutants that places an individual in danger of death or serious bodily injury. Certainly, anyone who deliberately harms others should be punished. But this bill would not require any actual harm. Furthermore, the penalties are severe--fines up to \$1 million per day and imprisonment up to fifteen years per day if the activity continues. Unlike the knowing endangerment provisions of other laws, this bill does not make a knowing violation of the law an element of the offense.

These are just a few examples of how this bill criminalizes a wide range of conduct and imposes unreasonably harsh penalties. While CMA agrees that enforcement is important, Congress should not adopt oppressive punishment that is out of proportion to an offense. It is not enough to rely on the "prosecutorial discretion" of Federal prosecutors to avoid unreasonable results. Any law that provides massive penalties combined with vague standards of conduct invites prosecutorial abuse, intimidation, and selective enforcement that threatens liberty.

c. Administrative Assessment of Civil Penalties

Any violation of any provision of Titles I, III, IV, or V may lead the Administrator to assess a civil penalty of up to \$25,000 per day per violation. A violation subject to civil penalty includes any operation of any regulated source in a state where the Administrator has determined that the State is not adequately conducting its new source review program.

Unlike the Clean Water Act and Safe Drinking Water Act, there is no limit on the maximum amount of an EPA-assessed penalty. While there is some opportunity for a hearing, the source has only 15 days from the date of notification to request a hearing. Such time is inadequate for a source owner to retain counsel and evaluate the allegations.

The Administrator may also create a field citation program which would allow a field inspector to issue citations for up to \$5,000 per day per violation, with no maximum total limit. Field inspectors should not be delegated this kind of unlimited power. There is some provision for a "hearing," but no guarantee of an opportunity to present evidence and cross-examine witnesses. Further, judicial review is limited to the record created at this "hearing."

d. Penalty Assessment Criteria

The bill outlines appropriate criteria for a court to consider when it assesses penalties. Unfortunately, however, the Administrator is not subject to the same requirements.

The bill forces a source to prove its innocence. A source will be deemed to be in noncompliance from the first date a violation can be shown until the date the source can prove it is in continuous compliance. This shifts the burden of proof and forces a source to prove its innocence. It offends traditional notions of fairness and the traditional presumption of innocence.

e. Rewards

The bill creates a system to pay bounty rewards of up to \$10,000 to anyone who furnishes information or provides services that lead to a civil judicial or administrative judgment. Because there are so many vague requirements, this provision is likely to encourage harassment of sources that are acting in good faith and are not causing any risks to public health or safety. This provision is unnecessary and counterproductive, and should be deleted.

f. Reviewability of Administrative Orders

The bill prohibits judicial review of most orders, notices, and subpoenas issued under the Act, including those to collect information under Section 114. The only exception is where EPA brings an action to enforce the order or subpoena. A source faced with what it believes is an illegal or oppressive subpoena is forced to violate the order or subpoena and risk further penalties to get judicial review. Only when the Administrator takes enforcement action can the court review the validity of the original order. This provision effectively coerces the source to give up its right to contest unlawful orders. It invites abuse by making EPA unaccountable for its acts.

g. Compliance Certification

The bill requires each regulated source to submit records to demonstrate compliance with all relevant regulations. In general, this is not unreasonable. However, the bill also requires the source to declare whether it is in compliance and whether that compliance has been continuous or intermittent during the reporting period. Once again, this calls on a source to make an admission that could result in criminal liability.

h. Scope of Emergency Orders

The bill authorizes the Administrator to issue orders when he determines there is a threat to public health or the environment. The bill removes the requirement of the current Act that the Administrator must seek judicial confirmation of these orders within twenty-four hours. By contrast, under this bill EPA may issue emergency orders and never seek judicial confirmation. A time limit should be preserved to encourage that EPA will use these orders only in true emergencies. In addition, the orders should apply only when there are demonstrated threats to public health.

i. Citizen Suits

The bill expands the citizen suit provisions that now exist to allow citizen claims for civil penalties. This provision is not necessary and should be deleted. Further, although the United States will be aware of any citizen suit, it may still bring a separate civil or criminal action at any time. This simply allows multiple enforcement cases for the same alleged acts.

IV. ACCIDENTAL RELEASES

The chemical industry devotes tremendous efforts to prevent accidents and to respond to releases that do occur. The industry constantly strives to improve its safety and response performance. Congress should avoid inadvertently interfering with and disrupting these effective efforts.

A. The chemical industry strives vigorously to reduce the possibility of accidental releases.

CMA members reduce the possibility of accidental releases through internal safety policies and procedures, individual and joint efforts to produce industry codes and guidelines, site-specific hazard assessments and strict compliance with local, state and Federal laws.

1. Company safety policies and procedures help prevent accidental releases.

In recognition of the potential dangers posed by intimate contact with the substances it uses and produces, the chemical industry has worked hard to ensure the safety of its workers. Companies improve worker safety by focusing management systems on safety issues, building safety into the design of each plant, training workers extensively, and providing workers with long-term medical surveillance. As a result, the chemical industry has earned an outstanding occupational safety record, possessing one of the lowest rates of lost-time injuries of any manufacturing industry in the country.

The chemical industry is one of the safest of all manufacturing sectors. The National Safety Council has consistently ranked the chemical industry either at or near the top in prevention of occupational injuries and illnesses. This ranking reflects continuing improvement in safety performance which carries over to the protection of the community from accidents. It is worth noting that many chemical manufacturers use safety performance as a criterion for evaluating plant management personnel. This translates into commitment.

2. Hazard assessments, though no panacea, are useful when tailored to serve the needs of individual facilities.

Chemical companies routinely perform hazard assessments to identify areas and set priorities for improving safety within facilities as part of comprehensive hazards management programs. Assessment specialists conduct hazard assessments using a variety of valid techniques tailored to the needs and conditions of a particular facility. Such assessments assist a company in developing its priorities for action to minimize safety problems. To be useful, these hazard assessments must explore site-specific conditions and reflect an intimate knowledge of the specific manufacturing process. For these

reasons, they contain confidential business information that a company must protect from disclosure to ensure continued competitiveness.

Hazard assessments (both qualitative and quantitative) are useful tools, but there is no single, universal methodology. Congress will greatly diminish the usefulness of the results if it subjects such assessments to rigid regulatory requirements and specifications. To professionals schooled in their art -- for hazard assessment is still as much art as science -- these studies can help them achieve a greater understanding of what they can do to assure safety. These actions can range from better plant design to more effective employee training. However, a hazard assessment is only one part of the effective comprehensive hazards management process currently in place.

3. *The chemical industry reduces the risk of accidental releases through company and industry codes and guidelines.*

The chemical industry works in other ways to reduce accidental releases. Each company develops its own internal training, process safety, and preparedness codes and guidelines. Also, companies work together with technical experts to develop consensus codes for industry to prevent equipment failures that could lead to accidental releases. There are hundreds of such codes and standards, written and approved by the best engineers in government, academia and industry. Organizations such as the American Institute of Chemical Engineers (A.I.Ch.E.), American Society of Mechanical Engineers (A.S.M.E.), and the American National Standards Institute (A.N.S.I.) develop these codes and standards. These technical documents represent a serious, ongoing commitment to safety. Active Federal intervention could disrupt and inhibit this very effective consensus-standards process.

4. *Congress should not disrupt the current safety programs by mandating specific safety requirements.*

The chemical industry constantly strives to improve its safety record. New Federal requirements may not help; in fact, they could hurt. Congress should not direct EPA to impose industry "specification standards" for design, hazard assessments, i.e., quantitative analysis, or for the elements of a process safety program. Specification standards are counterproductive and costly because they tend to stifle innovation and competitiveness, impose unnecessary costs, divert resources from site-specific priorities, and, in general, detract from industry's ability to continuously improve safe design and operations.

B. The chemical industry vigorously prepares for and responds to accidental releases.

In addition to its efforts to prevent releases, the chemical industry, together with other public and private entities, invests enormous energy in emergency preparedness and response.

1. Existing law provides substantial authority for effective emergency response.

Existing law provides substantial authority for effective response to accidental releases. The Occupational Safety & Health Act, Title III of SARA, transportation planning under the Department of Transportation, and authorities for Federal response by the Coast Guard and EPA each play an important role. For example, OSHA currently maintains a program designed to reduce the risk of sudden catastrophic releases of toxic chemicals. The program, which is described in OSHA Compliance Directive CPL 2-2, entitled "Systems Safety Evaluations of Operations with Catastrophic Potential," allows OSHA compliance officers to conduct safety inspections and issue citations or instruction letters where OSHA deems that additional protective measures are necessary. It also encourages employers to carry out voluntary system safety audits.

OSHA has also begun to develop a comprehensive process safety management standard. This standard will require manufacturers and users of hazardous chemicals to establish comprehensive management systems to prevent potentially catastrophic accidents. This standard will address not only hazard identification and assessment, but also training, accident investigation, follow-up and corrective measures, as well. The chemical industry generally supports this action by OSHA as a reasonable solution which recognizes the complexities of safety management.

An inter-agency group to coordinate such Federal activity that includes EPA, OSHA, DOT and others. This group now meets regularly. A benefit of such coordination is that it can avoid wasteful duplication of effort and better shape meaningful Federal policies that will make a difference. Experts from industry are working with this group, which was formed in response to the SARA Section 305(b) required study of chemical plant safety systems.

Under the existing National Contingency Plan, EPA evaluates and responds to accidental releases. Under Section 103 of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), anyone in charge of a facility or vessel from which there is a release of a hazardous substance, in excess of the reportable quantity for that substance, must immediately notify the National Response Center. EPA (if the environment or community is threatened), OSHA (if workers are threatened), the Coast Guard and other elements of the Department of Transportation are all equipped to move immediately to the site. They determine whether Federal efforts are needed to clean up or respond to the spill or whether other local or private entities are taking appropriate

responsive action. The Federal team can take charge of such response actions, if necessary.

2. *CMA's Community Awareness and Emergency Response (CAER) Program and SARA Title III provide effective emergency response preparedness.*

The chemical industry's Community Awareness and Emergency Response (CAER) program ushered in a change in the way the industry interacts with the community. One of CAER's missions is to coordinate and improve emergency response planning in plant communities and to make the public more aware of and familiar with industry operations. Plant employees work with local emergency response officials, other local industries and interested citizens to develop or improve community capability for responding to a chemical release. These efforts augment the work of the Local Emergency Planning Committees (LEPCs) under SARA Title III.

In fact, many community planning committees originally organized under the CAER program are now serving as LEPCs. The relationship developed between industry and the community through CAER has provided models for joint action and a wealth of valuable experience which readily transfers to the Federal SARA program.

CMA member companies, individually as well as together under the umbrella of state chemical industry organizations, assist LEPCs in emergency response planning and training, and provide emergency response equipment. Many CMA member companies provide volunteers and other assistance to support LEPCs, such as making computers available to assist in managing Title III information, and providing financial support and equipment. We found that the vast majority of LEPCs are in need of such support and are receptive to industry assistance.

For instance, one company has contributed all administrative support (such as typing, copying and postage) to an LEPC. The company also donates access to its corporate print shop to help publish the LEPC newsletter. In New Jersey, two companies contributed a \$45,000 computer and software package to the town and local hospital to coordinate information and communication under Title III, thus improving medical access to technical data.

3. *CMA operates important emergency and information services under the National Chemical Response and Information Center.*

The chemical industry's concerns for health extend well beyond the plant boundaries, to the safety of the public of neighbors and consumers. The chemical industry works cooperatively with communities to plan the joint response to accidental chemical releases, should such releases from manufacture or distribution occur despite the best efforts of the

industry to prevent them. CMA developed and operates several important emergency and information services under the National Chemical Response and Information Center (NCRIC).

NCRIC is composed of four programs: CHEMTREC, the Chemical Transportation Emergency Center, a 24-hour emergency response program; CHEMNET, a mutual aid program; the Chemical Referral Center, a non-emergency chemical information center; and training programs, which include the Lending Library, emergency response workshops and development of new training videotapes.

a. Chemical Transportation Emergency Center (CHEMTREC).

The Chemical Transportation Emergency Center (CHEMTREC) is NCRIC's oldest and most used public service. It provides immediate advice to callers on how to deal with transportation and fixed-site chemical emergencies, and notifies shippers or manufacturers of chemicals involved in accidents so they can take appropriate action. Established in 1971, it operates 24 hours a day, seven days a week, from CMA's headquarters in Washington, D.C. Over 3,000 shippers and manufacturers participate in CHEMTREC. In 1986, CHEMTREC added the Hazard Information Transmission (HIT) system, a data base through which the hazards, properties, and response information for more than 2,000 chemicals can be transmitted on hard copy to emergency responders at an accident scene. In addition, CHEMTREC soon will add the ability to automatically telecommunicate via facsimile machine chemical information to first responders in emergencies, including Material Safety Data Sheets for over 300,000 chemicals. Through an agreement with the State Department, CHEMTREC now can give emergency information in foreign languages.

b. CHEMNET.

CHEMNET is a mutual aid system that integrates the efforts of CHEMTREC, chemical producers, and emergency response contractors. CHEMNET provides the technical expertise and specialized equipment for hazardous materials emergencies. The system also increases emergency response capabilities throughout the United States.

More than 200 emergency response teams are a part of this system. A member chemical shipper activates the network when it cannot respond promptly to a distribution incident involving one of its chemicals. Experts from other chemical manufacturers or from emergency response contractors are dispatched to the scene, advising and acting on the safe handling of spills and fires to help with the emergency until the responsible company can get to the scene and bring the emergency under control. CHEMNET, like CHEMTREC, operates from CMA headquarters 24 hours a day.

c. Chemical Referral Center.

The Chemical Referral Center helps the public obtain non-emergency health and safety information about chemicals and chemical products from the manufacturers. Operators retrieve for the caller the manufacturer's address and telephone number from a data base that lists manufacturers of over 300,000 products. To date, 600 chemical companies have provided the center with the name and telephone number of a representative who can help the caller. Established in 1985, the Chemical Referral Center received over 15,000 calls in 1988, an average of 60 calls per day. Approximately 20 percent of the callers were customers or employees of the chemical industry. Twenty percent of the callers were consumers; 15 percent of the callers came from Federal, state or local government agencies; and 45 percent came from private organizations such as law firms, insurance companies, and commercial firms. Most of the calls (60 percent) were requests for health, safety or technical information on a chemical. More than 30 percent of the callers simply needed a telephone number at a specific company. The remainder of the inquiries were for regulatory information, transportation concerns, or for information unrelated to the referral-center service.

d. Training Programs.

The CMA Lending Library provides emergency responders with audiovisual training programs on how to handle chemical emergencies. Currently there are twenty-eight different training programs available on a loan basis. The programs cover a wide range of topics. Some specifically address the needs of first responders while other provide guidance on handling incidents involving specific chemicals to help response teams. These training programs are free and provide public responders with limited budgets for the training materials they need. Four of the programs are in the Lending Library; other sources are developing additional programs. Since start-up of the program in 1985, the CMA Lending Library has loaned out 7,500 programs and provided training to more than 365,000 persons. In addition, through CMA's emergency response training programs, CMA develops and sponsors emergency response workshops throughout the United States.

C. CMA supports a coordinated Federal program for reducing accidental releases

1. CMA supports a single, coordinated Federal program to prevent accidental chemical releases.

The Chemical Manufacturers Association strongly supports a single, coordinated Federal program to prevent accidental chemical releases with catastrophic potential. Such a program can help assure greater margins of safety for the public while helping America's chemical industry improve its already outstanding safety record. In particular, a Federal accident prevention program can provide meaningful assistance to consumers of chemicals, augmenting existing industry efforts to promote safe use and handling of our products.

2. Any Federal program should recognize the respective roles of OSHA, EPA, the Coast Guard and the Department of Transportation.

Any Federal program should be designed to coordinate the on-going activities of several responsible Federal agencies. Such a coordinated approach would not only encourage a broader understanding of the many elements that constitute the chemical industry, but eliminate duplication of effort and use resources more effectively.

For example, several agencies currently conduct chemical plant inspections and investigate accidental releases. Each agency has developed a body of expertise and a corps of talented, dedicated professionals who address various accident prevention programs from different perspectives. EPA collects information on accidental releases and develops information on toxic materials which pose potential hazards to the community and the environment; the Department of Transportation commits its resources to the prevention and control of transportation accidents involving chemicals; the Coast Guard fulfills its mandate to safeguard the waterways from toxic accidents; and the Occupational Safety and Health Administration works to assure American workers a safe and healthful workplace free of the hazards associated with chemical accidents.

3. CMA actively works with OSHA to develop safety standards as part of a comprehensive hazard management program.

CMA and its member companies support the ongoing Federal accident prevention activities and seek their continued success. Indeed, the chemical industry is actively working with OSHA to develop safety standards that will identify, assess and mitigate potential catastrophic releases as part of a comprehensive process hazard management program. This standard, which is based in large part on principles found in guidelines developed by the American Institute of Chemical Engineers' Center for Chemical Process Safety, will address the entire range of activities, from process design to waste management. OSHA's approach represents an innovative partnership between government and the private sector which other Federal programs can and should emulate.

4. CMA supports effective risk communication through its Community Awareness and Emergency Response (CAER) program and SARA Title III.

CMA has long sought to make local communities aware of the risks associated with the manufacture and use of chemicals. The chemical industry's support of such landmark regulations and laws as the OSHA Hazard Communication Standard and Title III of the Superfund Amendments and Reauthorization Act of 1986 illustrate that commitment. CMA designed the Community Awareness and Emergency Response (CAER) program as a means of providing the public with the information it needs to make decisions about the risks and the benefits of chemical manufacturing. CMA is proud that nearly 1600 sites around the United States have successfully implemented CAER. Other nations have also

picked up the CAER concept. The United Nations Environmental Program has recently adopted a similar program to prevent accidental toxic releases.

CMA clearly believes the industry should provide risk information to the general public that aids them in understanding the risks associated with industry operations. However, the chemical industry opposes a requirement to make detailed facility hazard assessments available to local citizen groups or environmental organizations for review. Hazard assessments are valuable screening and priority setting tools in the hands of professionals, but one cannot produce them with cookiecutter techniques or use them as an absolute measure of health risk. Each is as much an art form as an engineering exercise. They also can contain confidential business information.

Legislation that requires that detailed assessments be made public, or which assumes that a single technique can provide meaningful results, fails to appreciate the complexity of the problem. The government should avoid misleading approaches that assume a "value" for safety that can be calculated with a small computer and an off-the-shelf software program.

The Federal agency "team," as a priority, should develop alternate methods of communicating risk to the public that perhaps draw from, but do not include detailed plant hazard assessments. The chemical industry is prepared to contribute to that task.

5. If EPA develops a target list of chemicals for accident prevention programs it should focus specifically on chemicals causing significant acute hazards.

As part of any Federal program to coordinate and control the hazards associated with catastrophic releases, the Administrator of EPA should develop a list of chemicals of concern. He should base such a list on criteria such as toxicity, volatility, explosiveness, and combustibility. The public and the industry can use this list as they move forward to share information and manage risks. The Federal government can use such a list to target its efforts to identify and control potential hazards.

- D. CMA believes that the accidental release provisions of S. 816, despite some positive elements, contain provisions which would be unnecessarily expensive while doing little to prevent accidents.

The chemical industry wants to work with government to develop meaningful solutions to a problem that affects us all. The chemical industry supports appropriate action which coordinates the Federal efforts of OSHA, EPA, DOT and other agencies that concentrate on significant potential hazards. However, legislation is counterproductive if it establishes requirements that produce little or no safety benefit, or that results in redundant government programs.

1. Initial List of Substances

Under the bill, EPA promulgates a target list of substances using specific criteria. These criteria are appropriate because they focus on those materials which could legitimately have catastrophic potential in the event of an accidental release. The overwhelming evidence indicates that the greatest hazard associated with process upsets are fire and blast, rather than toxicity. However, the bill forces the Administrator to include a list of at least fifty chemicals identified in the bill, without regard to these criteria. By so doing, the bill apparently substitutes an ad-hoc, subjective legislative judgment for objective criteria. If EPA must regulate some arbitrary list of chemicals, without regard to the stated criteria, then the whole process loses credibility.

2. Hazard Assessments

CMA supports the use of hazard evaluations as part of an overall process safety management system. This system includes practices such as hazard identification, personnel training, inspection and maintenance programs, and accident investigation. CMA opposes any efforts to characterize risk assessment as a panacea which alone will improve safety in chemical manufacturing and consuming facilities. Hazard evaluations must relate to other program components. A hazard assessment should not become merely a paper exercise to meet arbitrary or inflexible legal requirements.

CMA does not believe that requirements for hazard assessments should be written into federal legislation. CMA believes that federally required and reviewed hazard assessments would waste government and industry resources and would be meaningless in terms of pursuing safety. Such an approach could limit the broad range of technologies now being used in favor of compliance with the government standard. The chemical industry already widely uses hazard assessments and promotes the practice with our customers. In fact, CMA supports the inclusion of hazard identification and assessment with the context of the process hazards management standard now being developed by OSHA. The distinction between that regulatory activity and the possible inclusion of such language in legislation is the focus by the Agency on hazard assessments as only one tool within the context of an overall safety program. Hazard assessments in and of themselves are useful only as a tool for evaluating the relative safety virtues of alternatives, i.e., a plant manager considering two alternatives for modifying a system would use a hazard assessment to determine which would give a higher degree of confidence that an accident will not occur. The results would have no utility to someone in a different plant, because they would be based on assumptions and circumstances unique to the first facility.

The requirement for a biennial update of hazard assessments bears no relationship to practical experience. There may be some facilities where such a schedule makes sense. However, most plants which do not experience significant process design modifications have little or no need for reviews of such frequency. In other cases, a two-year period

between evaluations may be too long. However, most industry experts agree that a 5-7 year cycle is adequate for plants that do not undergo significant change.

The bill appears based on the false premise that facilities can update hazardous evaluations with little expense. However, this is not the case, especially if assessments must meet the requirements listed in the bill. Each component of an assessment is connected to other components. To update the assessment, the facility operator likely must completely rework the assessment. This is simply wasteful. Such a use of limited resources contributes nothing to plant safety.

The bill directs the Administrator to promulgate guidance that industry must use in risk assessments. The bill does not clearly state whether the Administrator must include all of the elements listed in Section 129(c)(2)(A) through (I). It also does not state whether the Administrator can decide what he will require based on the record and his review of those elements. CMA opposes language which forces the Administrator to require quantitative risk assessments. Such assessments are only one of many equally valid evaluation techniques. Quantitative risk assessments are not always appropriate. Their findings also are not always valid unless one clearly understands the underlying assumptions and context.

3. Chemical Safety and Hazard Investigation Board

The Chemical Safety and Hazard Investigation Board is a concept which is of great interest to the chemical industry. The Board, which has surfaced in other bills, is based on the National Transportation Safety Board. In general, we have little difficulty with such an approach. In fact, if such an entity can facilitate the coordination of the various government agencies now doing this work, it could make a significant contribution. However, the industry is opposed to simply putting another layer of bureaucracy on top of an already extensive system of regulatory and investigative agencies. It is simply wrong to suggest that accidents might happen in the chemical industry which are the result of mistakes by OSHA or EPA, and that therefore a separate watchdog is needed to avoid coverups. In point of fact, the thousands of voluntary consensus codes and standards which are developed by ANSI, NFPA and others are far more important in the safe design and operation of chemical plants than any conceivable regulations will ever be.

A more helpful approach could be to view the Board as a coordinating group, which can help to better focus the energies of OSHA, EPA, DOT, and others on chemical plant safety. The Board can be a particularly useful vehicle for fostering the public-private partnership which is essential to improving the chemical industry's already outstanding safety record.

4. Regulatory Authority

The bill gives the Administrator authority to issue regulations as needed to assure that the manufacture, handling and storage of chemicals is as safe as possible. This provision openly invites EPA to become a "partner" in the design and operation of the chemical industry. The bill should avoid this dangerous and misguided temptation. The government should not attempt to micromanage the operations of the chemical industry. Excessive regulation simply reduces innovation in the chemical manufacturing industry. Plant design regulation may even have the unintended effect of causing the safest companies to meet some less protective universal safety standard and interfering with industry's ability to continuously improve safety performance. EPA clearly does not now possess the expertise it takes to develop these kinds of rules. Indeed, it is doubtful EPA or any government agency will ever have the needed expertise. Given the complexity and diverse nature of operations within industry, a massive infusion of new resources would not assure success. Instead of new design rules, Congress should allow the existing regulatory activities of EPA, OSHA and DOT to move forward, emphasizing additional cooperation and less redundancy.

E. The approach to accidental releases in S. 1490 is reasonable and properly focused.

CMA agrees that it is appropriate to establish a coordinated system for investigating major, life-threatening releases of hazardous air pollutants. We are pleased to see recognition of the role of the Department of Labor in this activity. There seems to be confusion, however, between the use of the term "board" and "panel" in the bill that should be corrected.

The bill restricts use of any reports prepared by the board in litigation where the United States is a party. Because these reports are likely to contain highly confidential information, they should not be used in any litigation arising from the event that was investigated.

EXHIBIT A

DOWNSTREAM CHEMICAL EMPLOYMENT FIGURES

(NUMBERS IN THOUSANDS)

INDUSTRIES	AL	AK	AZ	AR	CA	CO	CT	DE	FL	GA
Bituminous Coal & Lignite Mining	7.4									
Bituminous Coal Mining, Oil & Gas					32.2	3.7				
Oil & Gas Extraction				2.6	8.8	12.8				
Nonmetallic Minerals									8.5	
Masonry, Stonework & Plastering										
Furniture & Fixtures										
Stone, Clay & Glass Products	10.1	7.5	10.1	62.1		0.0			16.4	11.5
Primary Metal Industries	28.1	7.6	8.9	44.3		7.3	0.0		25.8	20.5
Fabricated Metal Products	21.5	8.2	15.4	136.7			13.1		5.8	15.5
Machinery, Exc Electrical	28.0		18.1	22.6		32.1	42.6		36.7	21.7
Electrical & Electronic Equip.	20.8		23.7	392.5		21.9	48.6		41.5	26.8
Transportation Equipment	29.9		11.7	314.5		17.9	47.3		81.8	31.3
Instruments & Related Products				120.2			83.8	8.3	68.3	44.1
Misc. Manufacturing Industries				37.3			24.6		17.4	
Textile Mill Products	40.7		2.6	16.8			0.0		9.9	
Textiles & Apparel							3.3	1.5	3.6	110.3
Apparel & Other Textile Products	58.5	4.7	11.7	129.4			6.4		34.3	65.7
Paper & Allied Products	20.9		13.6	41.1			9.4			
Printing & Publishing	13.2		16.9	12.2	164.7	22.8	28.6	2.7	86.9	14.6
Chemicals & Allied Products	11.3		5.9	73.8			21.3	33.4	23.8	19.6
Petroleum & Coal Products	0.7			28.3					1.5	
Rubber & Misc. Plastics Products	18.3		11.3	73.7			11.6	2.9	20.7	
Leather & Leather Products			5.4	6.5			0.0		2.5	
Lumber & Construction Materials										
Groceries & Related Products										
Apparel & Accessory Stores	15.4							2.9	63.6	
Furniture & Home Furnishings								2.4	55.9	
Personal Services								3.6	73.0	
Hospitals										52.5
TOTAL	357.5	44.9	166.9	1893.3	173.1	340.6	60.4	656.7	473.8	

* Blank spaces indicate states did not meet Bureau of Labor

Statistics requirements or too small of number to recognize

* Information obtained from the Bureau of Labor Statistics as of Feb. 1989

* MT statistics compiled from State Department of Labor as of 3rd Qrt. of 1988

* SD statistics compiled from State Department of Labor as of 1987

INDUSTRIES	HI	ID	IL	IN	IA	KN	KY	LA	ME	MD
			11.7				28.7			
Bituminous Coal & Lignite Mining										
Bituminous Coal Mining, Oil & Gas								54.2		
Bituminous Coal, Quarrying			3.8			8.3		2.6		
Oil & Gas Extraction										
Nonmetallic Minerals			17.0							
Masonry, Stonework & Plastering			18.1	23.3			4.7	0.7	0.0	3.0
Furniture & Fixtures	1.1	0.8	25.6	19.9	5.3	6.3	9.9	5.5	0.0	7.6
Stone, Clay & Glass Products			55.5	69.1	7.8	3.6	17.2	3.3	0.0	11.3
Primary Metal Industries		2.0	112.2	54.1	17.9	11.4	16.0	12.7	0.0	10.0
Fabricated Metal Products		5.7	145.7	66.0	44.9	31.8	9.1	0.0	0.0	17.9
Machinery, Exc Electronic Equip.		4.9	121.4	84.4	25.4	30.2	6.4	0.0	0.0	36.2
Electrical & Electronic Equip.			46.1	89.7	12.1	47.7	19.0	22.9	0.0	13.2
Transportation Equipment			39.3	16.2					0.0	4.8
Instruments & Related Products			24.7	10.8					0.0	2.3
Misc. Manufacturing Industries			3.5				6.6		6.3	1.5
Textile Mill Products	2.6			10.2						
Textiles & Apparel			15.3							
Apparel & Other Textile Products	31.6	1.9	33.7	13.7	5.1	5.5	31.6	10.1	3.0	9.9
Paper & Allied Products	3.6	4.6	113.1	37.9	21.1	20.3	8.8	12.3	17.7	9.3
Printing & Publishing		3.5	61.5	29.1	6.5	7.8	20.0	9.9	0.0	28.8
Chemicals & Allied Products			8.6	3.7		3.0	14.0	27.2	0.0	13.8
Petroleum & Coal Products			45.9	46.0	13.1		3.9	11.0	0.0	7.9
Rubber & Misc. Plastics Products	1.9						15.2		0.0	
Leather & Leather Products			4.1				2.4	12.2		
Lumber & Construction Materials										
Groceries & Related Products	0.1		60.8			11.3				
Apparel & Accessory Stores		3.7	39.1							
Furniture & Home Furnishings		7.3	57.0			11.8		14.4		
Personal Services	10.5		186.9							70.3
Hospitals										
TOTAL	51.4	34.4	1252.8	574.1	164.9	135.0	261.0	214.5	27.0	247.8

* Blank spaces indicate states did not meet Bureau of Labor

Statistics requirements or too small of number to recognize

* Information obtained from the Bureau of Labor Statistics as of Feb. 1969

* HI statistics compiled from State Department of Labor as of 3rd Qrt. of 1968

* SD statistics compiled from State Department of Labor as of 1967

INDUSTRIES	MA	HI	HN	MS	MD	MT	MB	NV	WI	NJ
Bituminous Coal & Lignite Mining						1.1				
Bituminous Coal Mining, Oil & Gas										
Bituminous Coal, Quarrying										
Oil & Gas Extraction				5.6						
Nonmetallic Minerals						2.0				
Masonry, Stonework & Plastering						1.2				
Furniture & Fixtures						0.4				
Stone, Clay & Glass Products	0.0	34.2	5.7	24.9	11.5	0.3	2.0		1.4	9.8
Primary Metal Industries	10.9	18.8	7.5	5.8	10.7	1.0		1.9	3.4	23.2
Fabricated Metal Products	15.6	47.0	7.4	12.6		1.2		1.1	4.6	19.1
Machinery, Exc Electrical	40.8	119.6	33.7	13.3	28.6	0.5			7.1	44.3
Electrical & Electronic Equip.	100.3	123.1	85.4	13.9	31.6	0.6	12.4		26.2	53.1
Transportation Equipment	99.7	35.1	31.0	23.3	44.6	0.2	9.7		23.0	79.7
Instruments & Related Products	31.5	309.4	10.4	21.7	75.8	0.3	5.1		0.0	14.8
Misc. Manufacturing Industries	53.0	18.2		1.6	12.2	0.2			0.0	32.5
Textile Mill Products	18.8	7.2		3.4	7.4	1.0			2.3	20.4
Textiles & Apparel	15.8	1.4		7.4		0.0			3.6	12.7
Apparel & Other Textile Products			4.8	22.9			2.4			
Paper & Allied Products	23.5	19.8		36.3					1.7	35.9
Printing & Publishing	24.9	20.5	33.0	8.2	13.1	0.6	1.7		5.7	27.6
Chemicals & Allied Products	56.4	43.2	47.8	7.1	42.0	2.5	9.6	4.5	8.7	68.5
Petroleum & Coal Products	18.8	41.5		6.4	30.1	0.5	2.4	0.7	0.0	118.2
Rubber & Misc. Plastics Products		2.3		2.1		0.8				8.2
Leather & Leather Products	27.0	48.8		10.9		0.1			0.0	34.2
Lumber & Construction Materials	8.4	2.6		0.6	18.2				3.2	2.7
Groceries & Related Products						0.6				
Apparel & Accessory Stores		41.8				2.3	7.0			52.8
Furniture & Home Furnishings		30.2				2.2	4.7			
Personal Services		43.6		7.9		2.6	8.8	6.8		39.0
Hospitals						13.0				119.8
TOTAL	615.7	1168.6	317.1	251.5	323.8	37.7	65.8	15.0	90.9	816.5

* Blank spaces indicate states did not meet Bureau of Labor

Statistics requirements or too small of number to recognize

* Information obtained from the Bureau of Labor Statistics as of Feb. 1969

* MT statistics compiled from State Department of Labor as of 3rd Qrt. of 1988

* SD statistics compiled from State Department of Labor as of 1987

INDUSTRIES	NM	NY	NC	ND	OH	OK	OR	PA	RI	SC
Bituminous Coal & Lignite Mining				1.1	7.7			17.4		
Bituminous Coal Mining, Oil & Gas										
Bituminous Coal, Quarrying	4.0									
Oil & Gas Extraction	9.0			2.4	6.8	41.4				
Nonmetallic Minerals								4.4		
Masonry, Stonework & Plastering							2.6	21.4	0.0	4.7
Furniture & Fixtures		23.5	87.8		15.3		4.0	45.9	1.8	11.1
Stone, Clay & Glass Products		31.1	21.5	0.4	46.7	10.9	10.7	92.4	4.5	8.5
Primary Metal Industries		25.5	12.7		100.7	4.6	11.6	91.8	8.8	15.8
Fabricated Metal Products		66.4	30.8	0.9	133.6	15.3	17.9	110.7	5.7	32.6
Machinery, Exc Electrical	2.7	132.5	62.1		163.1	32.8	16.1	90.0	11.4	22.4
Electrical & Electronic Equip.	5.7	142.7	58.4		85.7	9.1	10.3	61.1	9.4	10.7
Transportation Equipment	5.4	57.9	27.4		141.0	20.2	11.5	36.9	4.7	4.3
Instruments & Related Products		115.1			24.5	2.5	3.6	20.8	0.0	3.6
Misc. Manufacturing Industries		44.2	220.1				1.6	30.8	10.1	105.6
Textile Mill Products	2.7									
Textiles & Apparel		115.5	86.5		15.9	8.8	2.6	83.2	2.2	45.6
Apparel & Other Textile Products		43.0	21.8		37.3	4.0	8.9	41.4	2.6	16.2
Paper & Allied Products		162.6	30.0	2.5	71.8	10.9	13.6	83.7	7.0	10.9
Printing & Publishing		61.0	41.5		64.8		2.2	60.1	3.3	36.1
Chemicals & Allied Products		4.7				7.1	0.5	10.1		
Petroleum & Coal Products		36.1	33.8		9.3	11.3	4.7	40.2	6.3	24.5
Rubber & Misc. Plastics Products		15.6					0.5	10.3	2.0	
Leather & Leather Products										
Lumber & Construction Materials				29.9						8.3
Groceries & Related Products	5.3	96.9		2.5	44.6	12.6		51.2		
Apparel & Accessory Stores	4.4	58.5						34.7		
Furniture & Home Furnishings	6.5		32.9		59.1	12.6				17.9
Personal Services		294.2	55.8		184.0	29.9		240.6		
Hospitals										
TOTAL	45.7	1551.7	823.1	39.7	1211.9	234.0	122.9	1278.1	79.8	377.8

* Blank spaces indicate states did not meet Bureau of Labor

Statistics requirements or too small of number to recognize

* Information obtained from the Bureau of Labor Statistics as of Feb. 1969

* MT statistics compiled from State Department of Labor as of 3rd Qrt. of 1968

* SD statistics compiled from State Department of Labor as of 1987

INDUSTRIES	SD	TN	TX	UT	VT	VA	WV	WA	WC	WY	TOTAL
Bituminous Coal & Lignite Mining						11.7	28.7				118.9
Bituminous Coal Mining, Oil & Gas				2.4							32.2
Bituminous Coal, Quarrying			188.2				4.1				7.7
Oil & Gas Extraction	0.1										321.3
Nonmetallic Minerals	0.8										24.3
Masonry, Stonework & Plastering	0.6										18.0
Furniture & Fixtures	0.2	28.2	16.0		2.5	24.3		4.2	12.0		481.4
Stone, Clay & Glass Products	1.1	15.2	41.2		2.6	16.5	7.9	7.1	8.2		571.6
Primary Metal Industries	0.4	15.8	28.3	5.6	0.0	11.2	14.8	13.2	23.2		771.8
Fabricated Metal Products	1.4	41.7	77.6		2.9	18.7	5.5	11.0	59.2		1389.0
Machinery, Exc Electrical	4.9	38.3	106.3		4.5	20.5	5.7	18.9	110.6		1855.2
Electrical & Electronic Equip.	2.8	38.9	118.5	9.3	11.6	36.4	2.5	14.1	47.7		1896.6
Transportation Equipment	1.0	34.4	98.4	16.5	0.0	43.5		122.8	29.9		1988.1
Instruments & Related Products	1.8	10.0	24.5		0.0	6.1		11.8	13.0		803.7
Misc. Manufacturing Industries	1.4	12.2	14.6		0.0	3.3		5.7	10.2		265.1
Textile Mill Products		22.0	3.8		0.0	41.4			4.3		700.5
Textiles & Apparel				6.3							74.5
Apparel & Other Textile Products	1.4	83.0	57.6		1.1	27.7	3.4	6.1	7.3		1032.3
Paper & Allied Products	0.2	19.3	26.3		2.4	15.8		16.9	49.6		677.2
Printing & Publishing	2.6	35.7	75.5		4.7	35.0	4.9	21.8	44.8		1635.3
Chemicals & Allied Products	0.4	38.4	77.8		0.0	32.8	18.2	10.1	10.5		1027.3
Petroleum & Coal Products		0.7	28.3							0.9	128.4
Rubber & Misc. Plastics Products	1.0	25.2			1.2				28.0		609.2
Leather & Leather Products		9.4	8.2		0.0	0.9			6.2		121.8
Lumber & Construction Materials	0.4		12.7								13.7
Groceries & Related Products	1.2		54.7								96.4
Apparel & Accessory Stores	2.4	20.2	83.5			28.4	5.2		18.6		627.4
Furniture & Home Furnishings	1.8	13.9	45.4			24.8	4.0		13.9		336.9
Personal Services	2.8	27.8	86.9			37.5	7.0			0.8	706.0
Hospitals	11.5	68.3	177.9		8.7	75.9			72.9		2049.5
TOTAL	42.0	578.6	1429.2	40.1	42.2	512.4	111.9	263.7	568.1	1.7	20187.3

* Blank spaces indicate states did not meet Bureau of Labor

Statistics requirements or too small of number to recognize

* Information obtained from the Bureau of Labor Statistics as of Feb. 1989

* MT statistics compiled from State Department of Labor as of 3rd Qrt. of 1988

* SD statistics compiled from State Department of Labor as of 1987

EXHIBIT B

REGULATORY PROGRAMS CONTROLLING EMISSIONS
OF TOXIC AIR POLLUTANTS1. Section 109 -- National Ambient Air Quality Standards.

Over the past decade and a half, EPA, in conjunction with the States, has implemented the National Ambient Air Quality Standards program to control a number of so-called "criteria" pollutants, including ozone and particulate matter. Although this program is focused on controlling emissions of criteria pollutants, it has produced substantial reductions in emissions of toxic air pollutants as well. Thus, controls for particulate matter have greatly reduced emissions of toxic metals and other pollutants that are entrained on particulates. EPA points out, for example, that State Implementation Plan (SIP) limitations on particulate matter frequently reduce emissions of toxic metals by 80 to 98 percent. Similarly, controls on hydrocarbon emissions to achieve the National Ambient Air Quality Standard (NAAQS) for ozone have significantly reduced emissions of volatile organic compounds. For example, states typically require chemical plants in nonattainment areas to control volatile organic compound emissions from fugitive leaks, storage tanks, loading and unloading facilities, and process vents. As a result of these and other controls on volatile organic compound sources, EPA's National Air Quality and Emissions Trends Report for 1987 shows that emissions of volatile organic compounds declined 17 percent for the prior 10-year period.

In a 1985 study, "The Air Toxics Problem in the United States," EPA concluded that control of air toxics under the criteria pollutant provisions of the Clean Air Act has significantly reduced levels of toxic air pollutants. Furthermore, the annual incidence rate of cancer attributable to 16 studied pollutants fell by more than 60 percent in the decade from 1970 to 1980. Clearly, the air quality standards program for the so-called "criteria pollutants" plays an important role in reducing levels of toxic pollutants.

2. Section 111 - New Source Performance Standards.

Like National Ambient Air Quality Standards, New Source Performance Standards (NSPS) promulgated under Section 111 of the Clean Air Act substantially reduce emissions of toxic air pollutants. Section 111 standards, which are source-specific, limit emissions of designated pollutants, which may include various air toxics. For example, New Source Performance Standards for electric utility steam generating units, incinerators, sewage treatment plans, and many other sources establish limitations on particulate matter which

will effectively limit emissions of toxic metals. Similarly, New Source Performance standards for synthetic organic chemicals manufacturing, petroleum refineries, petroleum liquids storage vessels, synthetic fiber production, and other sources limit emissions of air toxics in the form of volatile organic compounds. Control programs to limit particulate emissions also reduce toxic air pollutants in the form of polycyclic organic matter.

Just recently, EPA published a new source performance standard limiting emissions of particulate matter from residential wood heaters. EPA projects that the new standard will reduce emissions of particulate matter by 436 tons per year by the fifth year of the standard. This new standard also controls polycyclic organic matter, a class of compounds containing carcinogens. EPA has identified products of incomplete combustion from sources such as residential wood heaters as a major contributor to the carcinogenic risk associated with toxic air pollutants. Thus, these large reductions in emissions of particulate matter and polycyclic organic matter represent an important step in the control of toxic air pollutants.

EPA also has indicated its intent to regulate municipal waste combustion sources under Section 111, by promulgating a New Source Performance Standard under Section 111(b) and by requiring states to regulate existing municipal waste combustion sources under Section 111(d). These regulations should reduce the risk of dioxin, dibenzofurans, metals and organics, as well as several other potentially carcinogenic constituents.

3. Mobile Source Provisions.

Regulations adopted under the mobile source provisions of the Clean Air Act (Title II) reduce toxic air pollutant levels, either directly or indirectly. These regulations limit the lead content of gasoline, control particulates from light- and heavy-duty diesel engines, and limit emissions from methanol-fueled vehicles. EPA is using Title II to develop a program to control emissions of gasoline vapor and related constituents during refueling, either through onboard controls or vapor recovery equipment at gasoline pumps.

4. Resource Conservation and Recovery Act.

Many view the Resource Conservation and Recovery Act ("RCRA") primarily as a statute to prevent exposure to hazardous chemicals through groundwater and surface water pathways. However, particularly in light of the Hazardous and Solid Waste Amendments of 1984, RCRA also protects human health from exposure to hazardous air emissions.

Section 3004(n) of RCRA, added in 1984, now directs EPA to "promulgate such regulations for the monitoring and control of air emissions at hazardous waste treatment, storage and disposal facilities, including, but not limited to, tanks, surface impoundments and landfills, as may be necessary to protect human health and the environment." Citing this authority, EPA proposed an accelerated program for the control of volatile organic emissions at hazardous waste facilities. EPA also is developing comprehensive air standards for hazardous waste facilities. Even before the 1984 amendments, EPA used RCRA to control air emissions from hazardous waste facilities, by adopting monitoring and efficiency requirements for incinerators and other thermal treatment devices.

A major effort to control emissions of toxic air pollutants under RCRA is embodied in EPA's pending proposal to regulate the burning of hazardous waste in boilers and industrial furnaces. This rule, which imposes technology-based performance requirements that are designed to achieve stringent health-based standards for carcinogenic and non-carcinogenic toxic air pollutants, is a good example of a regulatory program implemented outside the context of the Clean Air Act that has a direct and significant impact on emissions of toxic air pollutants.

The corrective action provision of Section 3004(n) of RCRA and the omnibus permit authority of Section 3005(d)(3) of RCRA authorize EPA and permit writers to address releases of hazardous constituents to the air. Actions taken under these provisions will further control air emissions at individual hazardous waste treatment, storage, and disposal facilities.

5. *Title III of the Superfund Amendments and Reauthorization Act of 1986.*

As described in more detail below, Title III of the Superfund Amendments and Reauthorization Act of 1986 ("SARA") established emergency planning and community right-to-know programs that significantly affect both emergency and routine emissions of toxic air pollutants. Subtitle A (Sections 301-305 of SARA) established emergency planning and notification requirements designed to alert local communities to actual and potential emergency releases of hazardous chemicals and to establish effective emergency planning and response mechanisms. Subtitle B (Sections 311-313 of SARA) established a variety of non-emergency information and reporting requirements, such as the submission

of Material Safety Data Sheets for hazardous chemicals (Section 311); the provision of inventory, location, and related information on hazardous chemicals (Section 312); and annual reporting of releases of toxic chemicals to the air and other environmental media (Section 313).

6. Comprehensive Environmental Response, Compensation and Liability Act of 1980.

The Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), established a comprehensive scheme for responding to the release or threatened release of hazardous substances at inactive hazardous waste sites, sometimes referred to as "Superfund sites." Such releases and threatened releases include air emissions. Accordingly, the increased level of hazardous waste site cleanup activity undertaken pursuant to CERCLA reduces locally significant toxic air pollutant levels in the vicinity of Superfund cleanup sites.

CERCLA affects toxic air pollution problems in several other ways as well. For example, Section 104 of CERCLA establishes the Agency for Toxic Substances and Disease Registry (ATSDR), which, among other things, conducts health assessments by developing information on the potential health effects of hazardous substances and by initiating toxicological research when available information is not adequate to identify levels of significant human exposure to particular hazardous substances. If ATSDR conducts a hazard assessment and finds that an exposure condition presents a significant risk to human health, the President may take whatever steps are necessary to reduce exposures and eliminate or mitigate the significant risk to human health.

7. Occupational Safety and Health Act of 1970.

Although the Occupational Safety and Health Act of 1970 focuses on protection of workers, it also directly and indirectly controls levels of toxic pollutants in the ambient air. For example, in order to comply with permissible exposure limits (PEL) established under OSHA standards, employers often must take actions that reduce emissions of toxic chemicals to the ambient air, as well as to the workplace.

8. Toxic Substances Control Act.

The Toxic Substances Control Act provides EPA with the authority to regulate toxic air pollutants in appropriate circumstances. For example, existing or contemplated asbestos and PCB regulatory programs under the Toxic Substances Control

Act reduce exposure to those substances in the ambient air. EPA presently is considering action under the Toxic Substances Control Act to limit or ban the use of chromium in comfort cooling towers.

9. Federal Insecticide, Fungicide and Rodenticide Act.

Although it typically is thought of as a statute concerned with levels of pesticides on food and in soil and groundwater, the Federal Insecticide, Fungicide and Rodenticide Act also affects the release of pesticides to the ambient air. Restrictions placed on the use, application or formulation of a pesticide can also reduce exposure to the pesticide in the ambient air. For example, EPA has banned manufacturers and formulators from using carbon tetrachloride in pesticide formulations.

10. Clean Water Act.

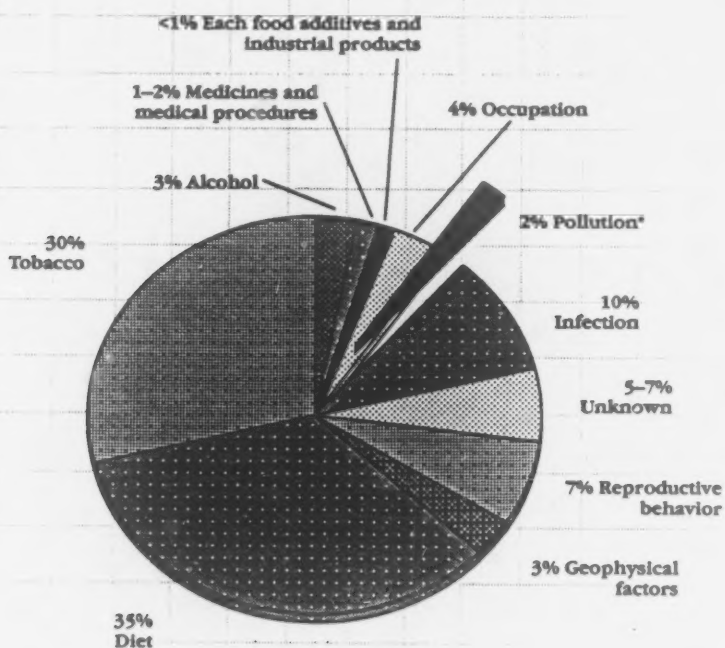
The Clean Water Act, although focusing primarily on levels of toxic pollutants in the surface waters of the United States, also has an indirect impact on levels of toxic pollutants in the ambient air. This is particularly true in the case of volatile pollutants: as the level of such pollutants in surface water is reduced, smaller amounts of such pollutants are available to volatilize into the ambient air.

11. State and local regulation.

As can be seen, a wide variety of federal regulatory programs in addition to the Clean Air Act already are having a significant impact on toxic air pollution levels in the United States, and this process likely will continue. But the regulatory efforts are not confined to the federal level. A March 1987 report prepared by the General Accounting Office noted that all but four states have air toxics programs in place or under development. Some states obviously have gone much further down the road of controlling air toxics than others. But virtually all of the states have begun to act in this area, and the trend clearly will continue.

EXHIBIT C

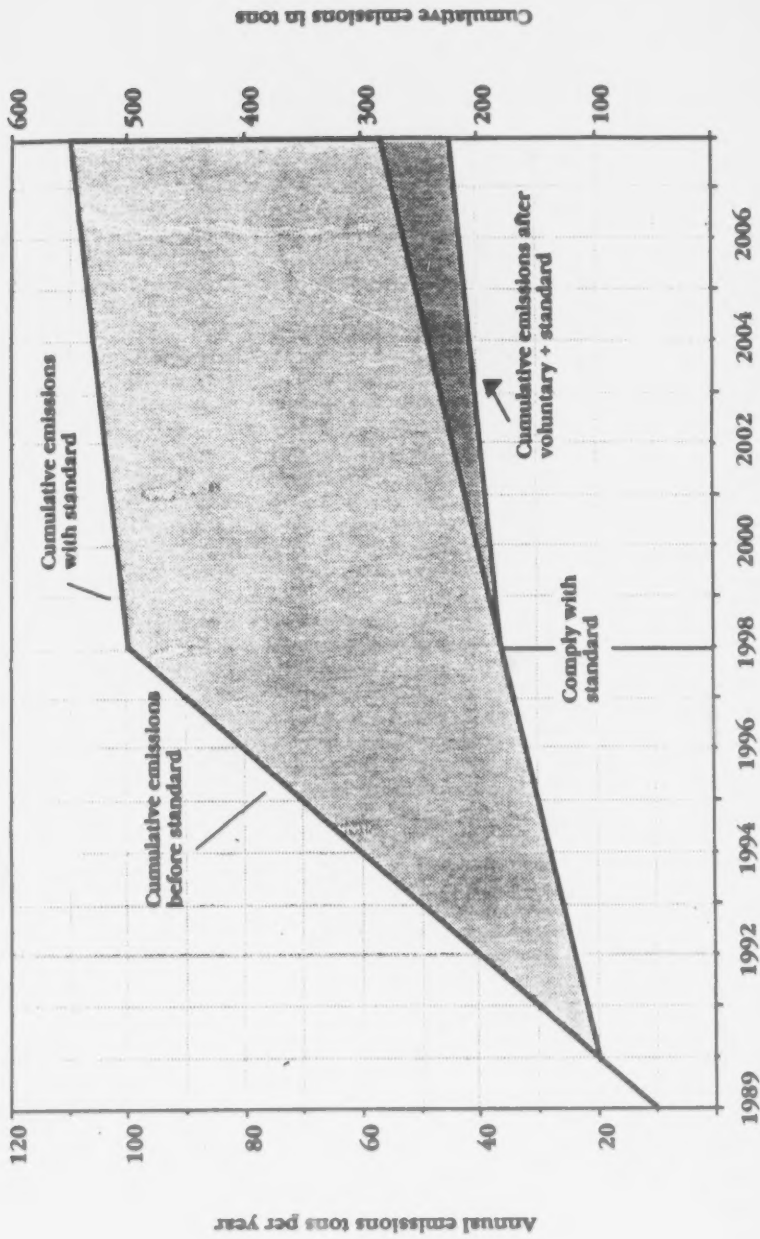
DISTRIBUTION OF CANCER CAUSES IN THE UNITED STATES



*Includes air, water, and food pollution. Air pollution includes asbestos, arsenic, and radiation.

Cumulative Benefit of Early Emissions Reduction

EXHIBIT D





CHEMICAL MANUFACTURERS ASSOCIATION

October 16, 1989

Honorable Max Baucus
Chairman, Subcommittee on
Environmental Protection
Committee on Environment and
Public Works
U.S. Senate
Washington, D.C. 20510

Dear Mr. Chairman:

Thank you for the opportunity for the Chemical Manufacturers Association (CMA) to comment further on questions that you and Members of the Subcommittee on Environmental Protection asked at the hearing regarding toxic air pollutants on September 21, 1989. As our witness Mr. Eugene McBrayer of Exxon Chemical Company stated, CMA supports the development of legislation to amend Section 112 of the Clean Air Act.

We are pleased to have this opportunity to supplement the record on three points that were raised at the hearing: our recommendations regarding the risk assessment study; our comments on EPA's estimates of cancer risk from air toxics and risks from accidental releases of air toxics; and, our view of the New Jersey Toxic Catastrophe Prevention Act.

First, CMA recommends that the legislation require review of risk assessment methodologies by an independent scientific organization. Risk assessment is a science that is rapidly evolving. We think an independent scientific group, such as the National Institutes of Health or the National Academy of Science, should review all the information available on risk assessment methodologies. Consistent with recommendations of the 1983 National Research Council report, "Risk Assessment in the Federal Government: Managing the Process," the study should evaluate the various methodologies for their ability to make use of all of the scientific data available, clearly separate science from policy, and quantify all uncertainties. That group should then formulate a set of peer-reviewed recommendations. These then should be submitted to the Administrator for his review and consideration. The group should continue to review available information and modify its recommendations whenever appropriate.

Second, CMA has reviewed EPA's report "The Air Toxics Problem in the United States: an Analysis of Cancer Risks for Selected Pollutants". This report is apparently the one that Senator Lieberman referred to in his questions about cancer risks from toxic air pollutants. EPA has conducted two studies that have produced estimates of new cancer cases that result from various air pollutants in the

Hon. Max Baucus
Page 2

environment. EPA's 1985 report referenced above, estimates that about 1300 to 1700 new cancer cases result annually from volatile organic and other carcinogens from both stationary and nonstationary sources.

In a more recent report (1987), the EPA examined in detail specific contributions of motor vehicles to cancer and estimated that between 385 and 2,286 new cancers resulted annually from these sources. The total number of cancer cases (excluding non-melanoma skin cancers) that occur annually in this country from all causes is about 850,000. Obviously, air pollution's relative contribution from stationary and nonstationary sources to the total cancer burden, even if the highest EPA figures are used, is small (less than 0.3%).

Thus, using EPA's estimate, less than 0.3% of these cases of cancer may be the result of specific toxic air pollutants. It is important to note that most of these cases were attributed to non-industrial sources. In its 1985 document "A Strategy to Reduce Risks to Public Health from Air Toxics", EPA states, "...several years of experience has led us to conclude that the chemical industry is not the major source of our national air-toxics problem...we now estimate that point sources associated with heavy industry (of which chemical manufacturing is but a small part) account for only 20-25% of cancer incidence from national air toxics. By comparison, over 50% of our national incidence appears to be due to road vehicles (including gasoline vapors and diesel particulates) and heating sources (including fossil fuel burning, coke ovens, and wood stoves)."

In comparison to air pollution, passive smoking and indoor radon exposure are estimated to result annually in up to 5000 and 20,000 cancers, respectively.

Even though air toxic emissions from chemical industry sources are estimated to account for only a small portion of new cancer cases, CMA is encouraging its member companies to achieve continuous improvement in further reducing emissions. CMA also supports amending the Clean Air Act to improve air quality through the early implementation of effective, practical and commercially available controls. We also support applying additional controls to sources that are determined to pose an unreasonable risk after implementation of technology based standards.

Senator Lieberman also referred to EPA statistics on accidents. We have reviewed EPA's Acute Hazardous Events Data Base (AHEDB), to which Sen. Lieberman apparently referred. Although the AHEDB is a valuable resource, it has some significant limitations. While it is true that people have lost their lives in events (particularly transportation events) that led to the release of chemicals, CMA is unaware of any instance in the data base where fatalities occurred in a community as a result of acute toxic exposure from an accidental release of chemicals.

Some people have tried to link the fatalities in the data base to acute exposure to toxic chemicals. This linkage cannot be supported by the data. In fact, the vast majority of the deaths resulted from

Hon. Max Baucus
Page 3

blasts, fires, or vehicle collisions. As an example, the explosion of a fireworks factory is the single most lethal event in the data base, with 13 deaths. Those few instances where fatalities did result from exposure to chemicals most often involved a process upset inside a containment structure.

Third, industry's experience with New Jersey's Toxic Catastrophe Prevention Act (TCPA) has been, at best, mixed. The law, which was adopted in 1987, was supported by the chemical industry as an appropriate mechanism for setting high standards of performance. An assumption throughout the legislative process was that companies would be allowed flexibility in meeting the law's requirements and that existing risk management practices should be evaluated on their merits.

Instead, New Jersey's Department of Environmental Protection (DEP) has opted for a prescriptive regulatory approach to implementing this law. As a result, conflicts between the public and private sector have obscured some of the positive elements of the TCPA. The regulations are currently the subject of negotiations between the state and the New Jersey chemical industry, with a judicial settlement possible.

Industry has found the TCPA's definition of risk management elements helpful. For example, the requirement for annual safety reviews, as defined by the regulations, has resulted in better maintenance of plant design documentation. This practice is clearly a sound one.

On the other hand, New Jersey requires a hazard analysis every four years. While the frequency may not be unreasonable, some plants will be required to go further and conduct quantitative risk assessments (QRA). This application reflects a common misunderstanding of QRA and its uses. QRA is a tool for weighing specific alternatives, not for generating absolute "risk values." For example, while use of a QRA study to help a plant manager choose between two types of pipe in a particular application is appropriate, using the results of two different studies, done by different people and based on varying conditions, to say one plant is safer than another is an invalid and wasteful exercise.

Perhaps industry's greatest concerns focus on the voluminous, detailed recordkeeping and reporting requirements and the lack of adequate safeguards of confidential business or process design information. While administrative costs are substantial, the potential loss of proprietary information through public release could be devastating in today's highly competitive, international chemical industry. Indeed, the DEP's confidentiality regulations prohibit claiming confidentiality protections on proprietary documents such as piping and instrument diagrams.

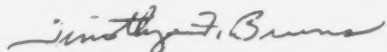
CMA supports a single, coordinated Federal program to prevent accidental releases with catastrophic potential. Coordinated Federal agency efforts involving OSHA, EPA, and DOT working with industry and the states provide the framework for achieving further improvements in safety. In particular, OSHA should be allowed to complete its

Hon. Max Baucus
Page 4

development of a comprehensive process management standard, addressing hazard identification and assessment, training, accident investigation, follow-up and corrective measures. We also believe an appropriately structured Chemical Safety and Hazards Investigation Board as proposed in S. 1490 could contribute to improved safety and public confidence.

We appreciate the inclusion of this letter in the record of the Subcommittee hearing of September 21, 1989. Please feel free to contact me or Ms. Karen Neale of my staff regarding this matter.

Sincerely,



Timothy F. Burns
Director
Federal Legislative Affairs

STATEMENT OF
GERALD V. POJE
OF THE
NATIONAL WILDLIFE FEDERATION

ON BEHALF OF
THE NATIONAL CLEAN AIR COALITION
BEFORE THE SENATE SUBCOMMITTEE ON
ENVIRONMENTAL PROTECTION

ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE
AT
HEARING ON

LEGISLATION TO CONTROL
AIRBORNE TOXIC CHEMICAL RELEASES

SEPTEMBER 21, 1989

My name is Gerald V. Poje. I serve as the environmental toxicologist working in the Environmental Quality Division of the National Wildlife Federation (NWF). The National Wildlife Federation is the nation's largest citizen conservation organization, with over 5.8 million members and supporters nationwide, and with affiliated organizations in 49 states plus Puerto Rico and the Virgin Islands.

I thank the Chair and members of the Subcommittee for the opportunity to provide oral and written testimony on legislative proposals to reduce the releases of airborne toxic chemicals. I am testifying today on behalf of The National Clean Air Coalition (NCAC). The NCAC commends the Subcommittee for bringing this important issue before Congress.

The Clean Air Coalition shares the national goal articulated by the President:

People living near industrial facilities should not have to fear for their health.

President George Bush
June 12, 1989

Any serious policy initiative to guarantee freedom from fear must incorporate provisions to reduce emissions of airborne toxic chemicals and to prevent chemical accidents. With strengthening amendments, the Toxics Release Prevention Act of 1989, S. 816 would represent a strong national solution to this problem.

My testimony focuses upon accident prevention provisions for the reauthorization of the Clean Air Act, examines two catastrophic accidents, and addresses the prevalence of chemical accidents and the status of chemical accident preparedness and prevention in industry and communities.

In order that communities around industrial facilities live free from their fear, it is essential that Clean Air Act Reauthorization:

1. Establish a Chemical Safety and Hazards Investigation Board to assure that chemical accidents will be subject to thorough investigations.
2. Promote chemical accident prevention by requiring industries to submit comprehensive risk management plans.
3. Direct EPA To Promote Accident Prevention by requiring EPA to develop and issue regulations which will promote chemical accident prevention technology and management at industrial facilities.

National legislation also must include strong provisions to reduce routine airborne toxic emissions and provide specific protection to the Great Lakes region. S. 816 needs several

specific strengthening amendments to adequately address these problems. However, I will defer discussions of these matters to David Doniger of the Natural Resources Defense Council, who is also testifying today on behalf of the National Clean Air Coalition.

Legislation Should Prevent Chemical Accidents

In the wake of the tragedy in Bhopal, India, Americans became more aware of the human health threat posed by chemical accidents. Despite existing legislation mandating emergency planning and despite authorities in the Occupational Health and Safety Act, three points need to be emphasized:

1. chemical accidents are not subject to thorough public investigations.
2. chemical accidents occur frequently in the United States, and
3. industrial facilities and communities are unprepared to understand and respond to the consequences of chemical accidents.

Chemical accidents pose more serious threats to communities than are commonly understood. These threats could be reduced substantially through a national risk reduction program beginning with strong federal legislation. The Toxic Release Prevention Act (S.816) with strengthening provisions provides the essential framework for this program.

Chemical Accidents Are Investigated Haphazardly

Bhopal's lesson needs to be reexamined in an American context. Wisdom suggests that necessity is the mother of invention. Equally true is the fact that chemical catastrophe should be the mother of chemical accident prevention. Two recent catastrophic accidents shows us how variable the responses to accidents can be, and why a national accident prevention program with strong accident investigation provisions is necessary to protect all Americans.

Example I. Henderson Pacific Engineering and Production Company Accident - May 4, 1988

The Accident

Just about noon, on May 4, 1988 the community of Henderson, Nevada was rocked by a series of four powerful shock waves when an ammonium perchlorate explosion erupted at the nearby Pacific Engineering and Production Company (PEPCON) plant. Ammonium perchlorate is a strong chemical oxidizer used as a solid rocket fuel component essential for propulsion of ballistic and technical rockets.

The catastrophic accident began just before noon as a fire started in the crystallizer processing unit which removes water from the oxidizer. This area had been the scene of previous fires. Water hoses spraying the fire proved unable to extinguish the flames, and firefighting attempts ceased after part of the roof blew off the building. A sequence of four explosions followed within a minute of each other, as large amounts of ammonium perchlorate which were stored in polyethylene drums and high volume aluminum tote bins ignited.

The accident killed two of PEPCON's employees and injured at least 250 others in the greater blast area, the youngest of whom was a 5 hour old infant. Shock waves shattered windows for miles around, blew automobiles into ditches, and ruptured underground gas lines.¹ Electric power and telephone service for nearly 12,000 nearby residents and businesses were disrupted.

Two hundred miles away in Pasadena, California, a seismograph at the California Institute of Technology recorded two explosions measuring 2.9 and 3.5 on the Richter scale of ground motion. Subsequent calculations by the Department of Energy rated the largest explosion as equivalent to detonation of a 7.5 kiloton warhead.

The smoke cloud billowing from the explosion and ensuing fire wafted numerous toxic chemicals into the atmosphere -- including lead oxide and hydrogen chloride. The National Weather Service tracked the cloud for over 350 miles from the accident site as far as Salt Lake City, where it was estimated to be 15 miles long and 6000 feet thick.

The American Insurance Association associated nearly \$100 million of insured property damage with the 10 minutes of violent explosions. Gary Bloomquist, the Henderson City Manager, projected that uninsured losses would cost \$20 million in addition to an estimated \$3 million worth of insurance deductibles. Immediate estimates by federal and state agencies estimated economic damages at \$73 million.

Five hours later, by the time the fires had retreated to a smolder, twelve PEPCON buildings were reduced to the rubble of cracked foundations and twisted girders. A 400 foot wide by eight foot deep crater was formed in the desert.

All the workers have lost their jobs. Not more than 200 yards from the blast site, stands the collapsed remnants of the Kidd & Company marshmallow factory, where 85 people have also lost employment.

¹Personal communication with Robert King, Nevada Emergency Response Commission, on May 12, 1988.

Approximately forty insurance carriers have filed suit against PEPCON for criminal negligence. Also named in the suit were the state Occupational Safety and Health Administration (OSHA) and the Clark County Fire Department. Key issues include the amount of ammonium perchlorate stored, the safety of the storage containers, prior knowledge of safety violations, adequacy of inspections, and appropriate recordkeeping.

The Analysis

On May 12, 1988, Governor Richard H. Bryan created The Henderson Commission by executive order to examine the adequacy of existing regulations pertaining to the manufacture, storage and transportation of highly combustible materials in the state of Nevada. The Commission's membership was broad, including representation by the Lieutenant Governor, a local elected official, a city manager, a union representative, a community religious leader, a fire marshal, a firefighter, a business leader, and an EPA scientist.

Provided with staff support, the Commission was directed to answer several important questions:

- Why did it happen?
- Could it have been prevented?
- Where could people turn to for help?
- What was the extent of the damage?
- Who was in charge?
- How can the state make sure that such an accident does not happen again?
- What other imminent dangers exist in our communities?

More than 50 hours of public testimony by informed citizens and experts were presented in nine separate hearings held by the Commission. On August 10, within its ninety-day deadline, the Commission submitted its report to the Governor.² Forty three major recommendations were identified in six categories: fire; health and safety; zoning; insurance; community planning and response; and transportation.³ Nearly one year later, the status

²The Governor's Blue Ribbon Commission to examine the adequacy of existing regulations pertaining to the manufacture and storage of highly combustible materials. (The Henderson Commission) Final Report. August 10, 1988. Available from the Nevada State Fire Marshall Division, Capitol Complex, Carson City, NV 89710. (702) 885-4290.

³Overall, the Commission affirmed the accountability of businesses for providing local government with detailed analyses of dangers and mitigation capability. Where perils cannot be reduced, it recommended that businesses relocate, and that local government develop laws to facilitate this.

The report stressed that public security cannot rely upon

of implementation of each one of the recommendations has become a matter of public record.

A more detailed account of the Henderson disaster has been gathered by the United Steelworkers of America, based upon more than 40 hours of taped interviews with PEPCON workers and examinations of state OSHA records, EPA records and Clark County Fire Department records.⁴ In addition, specific recommendations urge improved procedures for prevention inspections and accident investigations.

Example II. Shell Norco Refinery Catalytic Cracker Accident - May 5, 1988

The Accident

Less than 24 hours after the Pacific Engineering accident in Nevada, residents of Norco, Louisiana were jarred from their sleep at 3:30 in the morning by a massive petrochemical explosion at the Shell Oil Refinery. When the blast occurred, only 92 of nearly 1600 workers were on duty. The explosion ruptured a thirty year old catalytic cracker, which converts crude oil to refined oil products, such as gasoline and fuel oil.

Two weeks earlier the entire unit was shut down for routine repairs and installation of a design modification. The specific problem arose from corrosion in an eight-inch elbow joint in the de-propanizer elevated above the main body of the catalytic cracker. Failure of the piping released heated, pressurized hydrocarbons which exploded, destroying the catalytic cracker. A nearby control room also was damaged, as was a water supply-line for fighting the fire. Consequently, the fire raged for more than five hours.

Seven Shell employees were killed in the accident and 42 individuals in the blast area were injured -- 4 critically. Property damage was extensive in the nearby community of Norco as the explosion shattered windows, cracked walls and shifted foundations. Effects of the explosion were felt more than 30 miles away. The Coast Guard stopped traffic along the Mississippi River. Off-site costs have been estimated at \$30-40 million.

voluntary compliance with health and safety regulations. It asked that penalties be increased dramatically, and made more onerous for serious and repeated offenses. Recommendations also emphasized that enforcement efforts must be aggressive and coupled with rigorous and frequent inspections. Furthermore, public access to safety histories must be assured.

⁴United Steelworkers of America. The PEPCON Disaster. Henderson, Nevada, May 4, 1988. Report Issued March, 1989.

Internal costs to Shell are very large. The capital cost of the loss of the catalytic cracker has been estimated by Shell as approximately \$220 million.⁵ Estimates are not available for the many months of lost production, although the refinery had an estimated capacity of processing 215,000 barrels of crude oil per day.

On October 27, OSHA issued Shell Oil Co. a citation amounting to \$3630 for three safety violations, including one for failure to investigate the integrity of the carbon-steel piping in the de-propanizer. On November 17, Shell Oil Co. denied the OSHA findings and conclusions, but paid the citation, thereby terminating any further public investigation by a federal agency. According to a Shell spokesperson, pending litigation has been estimated at approximately \$100 billion.

Ironically, only two days before the accident, a Shell spokesperson had addressed the issue of accidents during a newspaper interview about toxic air emissions.⁶ Roger Fowler, manager of the Shell Chemical Co. in Geismar, Louisiana and spokesperson for the Ascension, Louisiana Community Awareness and Emergency Response (CAER) group assured residents that the threat of chemical accidents in the state was low due to the safety precautions taken by chemical plants.

The Analysis

Shell Oil has investigated the refinery accident using the internal corporation expertise of more than a dozen engineering specialists. In addition, Shell contracted with the Arthur D. Little consulting firm to analyze the accident. Shell's monitoring of the environment included analysis of environmental samples on-site, upwind and downwind for more than 50 miles.

Shell's investigation methods and analyses are not available to the public. The Louisiana Department of Environmental Quality has investigated the cleanup problem associated with the widespread dispersal of asbestos as a result of the accident, and has collected a large report from Shell Oil Co. on its response to the asbestos cleanup.

The Lesson - Learn From Mistakes

The PEPCON catastrophe captured the news media around the country. Reasonable public investigations by a blue ribbon commission and a safety-driven union followed. Far reaching

⁵Personal conversation with William Zolczer, safety engineer at Shell Oil, Co. in Norco, LA. November 10, 1988.

⁶T. Talley, "Plants plan to study air quality," Morning Advocate, Baton Rouge, LA, Friday, May 6, 1988, pg. B-1.

recommendations are available to guide stronger accident prevention and emergency planning for extremely hazardous chemicals.

The Norco catastrophe was deadlier and resulted in larger calculations of property damage. The national press diligently reported the disaster. However, no public blue ribbon commission reported to the Governor, and no federal task force has investigated the integrity of catalytic crackers.

These two accidents attest to the necessity for formal accident prevention and response planning at industrial facilities handling high hazard chemicals and a national approach to accident investigations.

Chemical Accidents Occur Frequently

The frequency of the accidental release of toxic chemicals is often underestimated. The Acute Hazardous Events (AHE) Data Base, put together by EPA, catalogued 11,048 events spanning 8 years. In other words, this partial listing of the chemical incidents in the U.S. provides a record of nearly 4 accidents every day.

According to EPA, these AHE incidents resulted in 309 deaths, more than 11,300 injuries and nearly 500,000 evacuations between 1980 and 1988. For some of these accidents, chemical identity and amount released are available as part of the incident record. Using a quantity/toxicity measure, EPA established that the U.S. has experienced at least 17 chemical accidents rated as having "Bhopal" potential consequences. Fortuitous weather, dispersion patterns and population densities prevented the actual harm from approaching the Bhopal consequences.

Under-reporting is a consistent problem in national data sets. Other, regional databases provide additional information of value. In 1987 alone, New York tabulated 1,002 chemical incidents, a 47% increase over the previous year. During that same year, California's Hazardous Materials Incident Reporting System logged 2,491 events under a voluntary reporting system. If California's pattern for 1987 was typical, that one state would have had nearly 20,000 accidents during an 8 year period - far exceeding EPA's national total. And in 1988, New Jersey reported over 6,000 chemical incidents.

⁷U.S. Environmental Protection Agency. Acute Hazardous Events Data Base. Office of Policy Analysis, Office of Policy, Planning and Evaluation. 1988.

Unfortunately, many states have insufficient resources to devote to the collection of centralized information on accident occurrence. The United States lacks a thorough and comprehensive picture of national accident incidence. Yet, even the incomplete information we do possess, indicates that accidents occur frequently, and have significant impacts.

Many Chemicals and Facilities Are Involved in Accidents

Many of the chemicals involved in the worst accidents, those which involved deaths or injuries, are familiar from reports in the news or war chronicles. Among the 684 toxic chemicals involved in the accidents catalogued in the AHE data base, highly toxic chlorine gas was involved in 125 of the 1,045 accidents with deaths or injuries. Hydrochloric acid, anhydrous ammonia and sulfuric acid vied for second place.

Some extremely hazardous chemicals, such as vinyl chloride, polyvinyl chloride, and formaldehyde, were more commonly involved in events leading to evacuations. I have listed the 20 chemicals most frequently involved in incidents recording death or injury.

Chemicals in the Most Serious Events

<u>Chemical</u>	<u># of Events</u>
Chlorine	125
Hydrochloric acid	68
Ammonia (anhydrous)	67
Sulfuric acid	63
Sodium hydroxide	27
Ammonia	26
Nitric acid	18
Toluene	17
Styrene	14
Phosphoric acid	12
Toluene diisocyanate	12
Benzene	11
Phosgene	11
Sulfur dioxide	11
Methyl ethyl ketone	10
Acrylonitrile	9
Hydrofluoric acid	9
Methylene chloride	9
Hydrogen sulfide	9

About 70% of the accidents described in the EPA review occurred at fixed facilities. The other 30% occurred during hazardous material transportation incidents. Accidents at the facilities of primary producers account for the largest share of fatal accidents (39%), and accidents at these facilities resulted in the most injuries (3,377). Distributors ranked second in injury events with 25%, secondary producers third with 17%, end users for 9%, and waste disposers for only 1% of the injury event.

According to the information presented in the EPA document, equipment failure is responsible for nearly half of the accidents which are occurring. Operator error accounts for about 20%, and the remainder result from a variety of possible causes. Over half of the accidents are occurring under normal or standard

operating conditions. It appears that the major causes of accidents are the very ones that could be better controlled.

The Tip of the Iceberg?

While the EPA accident database covers a broad section of the accident spectrum, it focuses primarily on air releases which had the potential to produce an immediate and catastrophic human health disaster of the kind witnessed in Bhopal. However, this database represents only a portion of the problem posed on a national scale. The database does not include all hazardous chemicals, a nationwide survey of accident responders, or an assessment of the long term health effects of exposure to toxic chemicals.

Many chemicals and classes of chemicals were excluded from the database. For example, petroleum related accidents and those involving polychlorinated biphenyls were excluded. As we have learned from the recent Exxon Valdez incident, the potential for environmental damage from petroleum cannot be understated. Furthermore, petroleum products not only pose explosive hazards, but many petroleum related chemicals including benzene, and other volatile hydrocarbons that are considered to be carcinogenic. Twenty five percent of California's accidents involved petroleum related events, which the EPA has chosen to exclude from consideration.

Five years after the Bhopal tragedy, where more than 3,000 people died and over 100,000 were injured, accident related deaths and injuries continue to accrue. Chronic health impacts in the population of 11,300 Americans exposed during the incidents catalogued by EPA are not known, nor are they currently under investigation.

Industries and Communities Are Unprepared

In 1985, EPA launched its voluntary, national Chemical Emergency Preparedness Program (CEPP) to foster community planning and preparation for releases of extremely hazardous substances from local chemical facilities. Congress later incorporated many facets of CEPP into its more comprehensive Emergency Planning and Community Right-To-Know Act (EPCRA) provisions which became national law in 1986.⁸

⁸The Comprehensive Environmental Response, Compensation and Liability Act of 1980, (CERCLA), 42 U.S.C. §9601 et seq., as amended by the Superfund Amendments and Reauthorization Act of 1986, Pub.L. 99-499, 100 Stat. 1613, (October 17, 1986), (SARA); The Emergency Planning and Community Right-To-Know Act, (SARA) §300 et seq. (1986).

Section 305(b) of EPCRA required EPA to conduct a "review of emergency systems for monitoring, detecting, and preventing releases of extremely hazardous substances at representative domestic facilities that produce, use, or store extremely hazardous substances." In June, 1988 EPA released its report highlighting many ways in which industries and communities are unprepared to respond to chemical accidents, and emphasizing that more comprehensive and effective emergency planning measures must be implemented.⁹

Facilities handling 21 selected extremely hazardous substances and the communities surrounding these facilities were given questionnaires to assess the effectiveness of their emergency planning programs. EPA examined the following areas where emergency planning efforts were found to be deficient:

1. General Management Approach
2. Prevention Systems
3. Monitoring and Detection Systems
4. Public Alert Systems

Weaknesses in emergency planning implementation were cited by EPA in each of these areas.

Management

The safe design, operation, and maintenance of a facility depends on the commitment of management to emergency preparedness and accident prevention. However, the 305(b) report found that the management approach of roughly 2/3 of all responding facilities was not dedicated to "setting goals and measuring achievements." About a quarter of the managers did not seem to appreciate the risks and hazards involved in their operations, and many facilities (especially the smaller ones) considered only worker safety issues rather than issues of community safety from chemical releases. The management of many facilities in the chemical industry are not suitably knowledgeable of or committed to emergency planning. This lack of management commitment is reflected in limited action in the following three areas: training programs, preventative maintenance, and management improvement efforts.

Managers of many facilities are not insuring proper emergency planning training for employees. Not only may inadequately trained operators cause accidents, but without proper training, even the best emergency planning equipment and plans may prove to be ineffective. At some facilities where accidents have occurred, managers have ordered operators to use

⁹U.S. Environmental Protection Agency. Review of Emergency Systems: Report to Congress-Section 305(b) Title III Superfund Amendments and Reauthorization Act of 1986. Office of Emergency Preparedness, Office of Solid Waste and Emergency Response. June, 1988.

equipment in ways directly conflicting with posted procedures. The 305(b) report indicates that formal training programs appear to exist only at larger facilities.

Preventative maintenance is also an essential part of effective emergency planning management, yet more than a third of all responding facilities reported that they have no preventative maintenance programs. The few that do implement preventative maintenance do so irregularly and only for a limited range of process equipment.

EPA also observed few cooperative efforts among industries to develop and share better emergency planning management techniques. In the 18 month period prior to the release of the report, fewer than one percent of the presentations at meetings and symposia on management dealt directly or indirectly with chemical safety.

All in all, EPA's reports documents very limited commitment on the part of industry management to develop and fully implement emergency planning and prevention measures. This lack of management commitment jeopardizes the entire emergency planning process.

Prevention Systems

The management of many chemical facilities are in large part ignorant of existing technologies and techniques available for the prevention and mitigation of accidental releases of extremely hazardous substances. Prevention system technologies and techniques are not in wide use in chemical facilities.

EPA's report found that on-going efforts to inform chemical facilities about hazard evaluation techniques need to be expanded. Hazard evaluation techniques are formal techniques used to identify process risks that could lead to an accidental release. Hazard evaluation procedures provide a means of identifying needed changes in process design, operation, or monitoring. While many respondents stated that they use hazard evaluation methods, less than half are using AIChE-recognized techniques.¹⁰ What many facilities described as their hazard evaluation techniques were in reality little more than simple routine safety inspections and measures.

Chemical release prevention systems are not built into the process design of many chemical facilities, as they should be. Fewer than half of the respondents recognized the need for

¹⁰The American Institute of Chemical Engineers (AIChE) has published an authoritative report which identifies 11 formal hazard evaluation techniques which enable facilities to identify hazards on-site and in a process.

redundant controls as backups. While facilities consider worker safety in their process design, little priority is placed upon preventing chemical releases to the environment in a facility's process design.

Available equipment and procedures to capture, neutralize, or destroy a toxic chemical before it is released to the environment are not widely used in facilities. Examples of such equipment and procedures include using emergency scrubbers and flares to treat reactive or soluble gases or vapors. However, scrubbers are not widely used as protection measures against accidental releases; only the largest facilities have stand-by scrubbers to be used for accidents. Similarly, flares are found often only at large facilities handling large volumes of chemical gases.

Because these prevention systems are not widely implemented in chemical facilities, chances of accidental releases are increased greatly.

Monitoring and Detection Systems

Many technologies exist for monitoring and detecting chemical releases, although they are not widely in use and many facilities know little about them. For many chemicals considered in the study, facilities indicated a lack of awareness of the risks of chemical release and of available detection systems and their utility. Some facilities using ammonia as a refrigerant, for example, did not appear to recognize the potential risks from the release of ammonia vapor, or of the reliability of available ammonia detection systems. Such facilities frequently contain large quantities of ammonia and are often unattended at night. These facilities should be better informed of the availability and capability of existing detection systems.

Currently, the primary method used by industry to detect releases is direct observation by process operators and other personnel who may either see, hear, or smell the release. Such a system obviously is of no use in detecting colorless and odorless toxic gases, and effects of the gas may be harmful to the worker functioning as the "canary in the coal mine."

Some facilities use multi-detector systems to detect chemical leaks, yet the majority of these facilities use chemical-specific systems which detect only certain chemicals. Very effective laser-based remote sensing detection systems are available, although they are not in widespread use. Perimeter monitors placed outside the facility were in use by a few of the responding facilities, with limited detection success. Improved emergency monitoring and detection systems should form the core of an accident prevention program.

Public Alert Systems

Accident mitigation requires an informed public. Once a release has occurred, the facility must notify community contacts who in turn must then notify the public of dangers posed and actions to be taken. At each step, technological difficulty or procedural uncertainty may delay the notification process and prevent the public from receiving the alert swiftly.

The initial step in the public alert process is the facility's notification of the appropriate community officials. The two primary channels are commercial telephones and two-way radios. Although these represent the most common form of communication systems, experts do not consider them reliable. Telephones may fail (perhaps due to the chemical accident) or may be busy. Two-way radios may operate at different frequencies, may be found inoperable, or may be difficult to use because of heavy traffic on the appropriate frequency. Communication systems designed to overcome such problems, for example, 911 telephone systems or separate telephone lines not linked with commercial traffic, were not commonly used in the communities surveyed. Advanced communications equipment existed in relatively few situations.

Two thirds of the facilities responding to the survey did not have clear decision-making procedures for determining when a release necessitated notifying the community. The majority of facilities described rather vague procedures or did not describe procedures.

The next stage in the public alert process is to both alert the affected public of the danger and to notify them of what steps are to be taken. A variety of techniques, including radio, sirens, P.A. systems and door to door visits were all used in plans for alerting and notifying the public. All of these systems would be effective in alerting the public in an emergency with a three to four hour lead time. However, in the event of a chemical accident where warnings may be needed in a matter of minutes, the 305(b) study states that the majority of systems in place would most likely not provide an effective warning in time. Few communities were found to be using the most sophisticated warning systems technologies, even in communities with large numbers of people and high-risk populations.

While almost two thirds of communities responding indicated that they had a written warning plan or procedure of how to notify the public, half of the communities were not able to describe clearly what these procedures were. This suggests that many of the communities do not fully understand the contents of their plan and were not able to communicate the plans.

Once notified of an accident, the community needs to know the specific details of the situation in order to decide upon

necessary actions. However, many communities did not know what information to ask for in an emergency. Relatively few communities indicated a need for information on plume or release location, speed of dispersion, potential pathways, or protective action recommendations.

Many communities were geared to an all or none evacuation policy; such policies may reduce the decision making process, but may increase the threat to the public by unnecessarily exposing people to chemicals from which they would be better protected by remaining indoors. Very few communities indicated the need to know what the facility was doing to control the accident or whether community assistance was needed. Two thirds of the communities had no clear or standard procedures for making decisions on public instruction, and outlined only vague procedures and in a few cases no procedures.

An effective emergency planning system requires pre-accident testing and public awareness. The majority of communities have either no public information program in place, or a poorly developed one. While most communities indicated occasional testing of public alert equipment, a few reported testing less often than monthly, and some reported no testing at all. Half of the responding communities reported no coordination with the chemical facilities in their exercises. About a third of the communities indicated that they had only initial contact or no contact with the chemical facilities.

1985 and 1986 Inspection Findings in New Jersey

Studies conducted by the state of New Jersey cite specific examples of insufficient emergency planning and prevention measures.¹¹ In 1985 and 1986, as New Jersey representatives were creating the Toxic Catastrophe Prevention Act in response to the Bhopal tragedy, the New Jersey Department of Environmental Protection (NJDEP) began evaluating facilities that had the potential for accidental release of highly toxic chemicals in New Jersey. Independent consultants for the NJDEP conducted inspections of 25 state facilities handling six chemicals of high toxicity.¹² These inspections uncovered many deficiencies reflecting key element of industrial management programs at chemical facilities which had not been adopted or implemented, and which could lead to accidental releases of toxic chemicals.

¹¹New Jersey Department of Environmental Protection. Basis and Background Document for Proposed New Rule - Toxic Catastrophe Prevention Act Program. Bureau of Release Prevention. September, 1987.

¹²The six chemicals targeted in the New Jersey study were allyl chloride, bromine, chlorine, ethyl mercaptan, phosgene and phosphorous trichloride.

The deficiencies found in the course of these site inspections are as follows:

1. Piping and instrument diagrams were not updated.
2. Valves and piping were not adequately marked.
3. Electrical wiring was not protected.
4. Emergency backup equipment or systems were not adequately protected.
5. Emergency pressure relief devices were piped to discharge hazardous substances directly to the atmosphere.
6. Interlocks were lacking.
7. Operators had the capability to override equipment alarms while operations continued.
8. Fire protection systems were inadequate and poorly designed (hydrants were improperly positioned, fire fighting equipment was placed at inaccessible locations, and fire alarm signals were inadequate or confusing).
9. Operating manuals did not include instructions for operator action during failure of utilities.
10. Tankage at loading or unloading areas did not include high-level shut-off devices.
11. Hazardous gas monitoring sensors were not installed in areas where releases or spills from loading or unloading operations were possible.
12. Hydrogen sulfide gas monitoring sensors were not installed in the vicinity of a sulfur recovery unit.
13. Chlorine gas monitoring sensors were not installed in the vicinity of a chlorination reactor.
14. Hydrogen sulfide flares did not include safety relay or alarm from pilot light failure or supplemental fuel to increase heating value.
15. Emergency backup water supply to an emission control device to reduce the quantity of release of chlorine was not installed.
16. Fire water sprinklers were improperly placed directly above manual charging hoppers used to handle substances highly reactive with water.
17. Loading racks for an acid were in a state of severe deterioration.
18. External surfaces and supports of a brine cooled reactor were in a state of severe deterioration.
19. The wall thickness of acid containing vessels and piping was not periodically tested.

S. 816 Would Promote Chemical Accident Prevention

Chemical accidents at industrial facilities are frequent and pervasive problems. While individual impacted facilities and communities may learn important lessons from an accident, improve safety consciousness and implement specific accident prevention measures, it is by no means guaranteed under the present system. Chemical accident prevention has not yet become national policy.¹³

Unfortunately, the recent Clean Air legislation proposed by President Bush (S. 1490) does not provide for substantive accident prevention. The Clean Air Coalition urges broad support from Congress and the Administration for the accident prevention provisions in The Toxic Release Prevention Act of 1989 to achieve three important goals:

1. Promote Chemical Accident Prevention

S. 816 requires industrial facilities which handle dangerous toxic chemicals to prepare hazard assessments. The bill would require EPA to identify a list of toxic pollutants for which industrial facilities must prepare hazard assessments, and establishes an appropriate mechanism for adding and deleting chemicals to the list.¹²

Comprehensive plans as identified in S. 816 should be expanded to include specific requirements to identify the on-site storage and management techniques, the on-site and community consequences of accidental releases, and specific accident

¹³In 1986, Congress passed the Emergency Planning and Community Right-to Know Act (EPCRA), requiring industry to share with the public information about hazardous chemicals to prepare for chemical release accidents. An unfair burden of responsibility lies on the shoulders of community volunteers for analyzing facility hazards and their potential impact on the community. The Occupational Safety and Health Administration (OSHA) has not revised its standards for hazardous materials to reduce the risks of chemical accidents. Furthermore, OSHA's narrow jurisdiction over workplace safety is inadequate to address community protection from accidents.

¹²In light of existing knowledge about highly toxic chemicals identified as extremely hazardous, extraordinarily hazardous and toxic by inhalation, the Clean Air Coalition recommends that the Subcommittee name additional candidate chemicals at this time, increase the total number of listed chemicals to not less than 100, and promulgate the list of named chemicals within 12 months of passage of this legislation. Such action would advance the pace of accident prevention planning.

prevention measures and response preparedness at the facility.¹³

2. Direct EPA To Promote Accident Prevention

S. 816 would build an effective EPA Accident Prevention Program by requiring EPA to develop and issue regulations which will promote chemical accident prevention technology and management at industrial facilities. We urge the committee to strengthen the accident prevention authority section by expanding the scope to include accidental release detection and response regulations.

3. Establish a Chemical Safety and Hazards Investigation Board. *

S. 816 would provide the public with another important measure of safety - the assurance that chemical accidents will be subject to thorough investigations.¹⁴ An independent board, modeled after the National Transportation Safety Board¹⁵, would be established to investigate all accidents, report on their causes, and make recommendations for preventing recurrences. The President's proposal, S. 1490, is fatally flawed in this regard, because it lacks independence, provides insufficient definition for the investigation board and because it would operate on an ad

¹³New Jersey and California have increased the burden of proof on industries which handle dangerous chemicals by requiring specific risk management plans. Under these plans, industry is asked to evaluate the potential for accidents, calculate the impacts on the surrounding community, and identify the safety technology and training necessary to prevent accidents. This process may well save a great deal of money in clean up and liability costs, as well as prevent needless death, injury and damage.

The Clean Air Coalition urges the committee to adopt the more extensive prevention provisions requiring Risk Management plans as provided for in the Air Toxics Control Act of 1989, H.R. 2585.

¹⁴We urge the committee to adopt strengthening provisions from H.R. 2585 which include: greater independence of the board, expanded authority to evaluate accident prevention activities in other Government agencies, and obtaining more rapid and detailed response from the EPA Administrator when presented with a recommendation from the board.

¹⁵In 1974 Congress passed the Independent Safety Board Act giving the NTSB increased authority in accident investigation, including hazardous materials in transport and severing its ties with the U.S. Department of Transportation. Sound public policy argues for similar strict separation of accident investigators from accident prevention regulators when evaluating chemical accidents at fixed facilities.

hoc basis during each accident event.

Conclusion

People living near industrial facilities have reasons to fear. Not only do routine emissions threaten long term health and security, but chemical accidents pose a more serious threat to communities than is commonly understood. Chemical accidents occur frequently in the United States. Industrial facilities and communities are unprepared to understand and respond to the consequences of chemical accidents. Furthermore, chemical accidents are not subject to thorough public investigations. This threat could be substantially reduced through a national risk reduction program beginning with federal legislation, as embodied in the strengthened provisions of S. 816.

TESTIMONY OF
ROBERT P. MILLER
CHIEF, AIR QUALITY DIVISION
MICHIGAN DEPARTMENT OF NATURAL RESOURCES
ON BEHALF OF THE
GREAT LAKES ENVIRONMENTAL ADMINISTRATORS
ON S. 816
BEFORE THE
SENATE ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON
ENVIRONMENTAL PROTECTION
SEPTEMBER 21, 1989

Chairman Baucus, Members of the Subcommittee, my name is Robert P. Miller and I am the Director of Michigan's air pollution control program. I appear here today on behalf of the Great Lakes Environmental Administrators under the auspices of the Council of Great Lakes Governors.

The Council of Great Lakes Governors represents the governors of the eight Great Lakes basin states of Michigan, Ohio, Indiana, Illinois, Wisconsin, Minnesota, New York and Pennsylvania. The Great Lakes Environmental Administrators are responsible for implementing the nation's environmental protection rules and regulations in these states. I thank you for inviting me to testify on the air toxic substances legislation being considered by this subcommittee.

Overview

There are many avenues of exposure to toxic compounds. Because of cross-media impacts, air and water quality program strategies need to be coordinated. Toxic substances deposited from the atmosphere into aquatic ecosystems such as the Great Lakes can bioaccumulate and have a much greater effect on the environment and human health than as ambient air pollutants.

This problem is one of the most important environmental issues confronting the Great Lakes region. We propose consideration in the Clean Air Act amendments of these special problems, especially those related to seven persistent air toxic pollutants of greatest concern.

Background

Human health and water quality in the Great Lakes basin are threatened by toxic contaminants from numerous sources, transported through a variety of pathways. A significant portion is attributable to air transport and deposition. Research indicates that the atmosphere contributes from 46% to 99% of the lead, 7% to 90% of the polychlorinated biphenyls (PCBs), 22% to 97% of DDTs, and 72% to 96% of benzo(a)pyrene entering Great Lakes waters, depending on contributions from other media to each of the respective lakes.

Much of the atmospheric contribution is believed to result from long-range transport to the region from great distances. Concerns about atmospheric deposition of toxic contaminants first arose from research on Isle Royale in Lake Superior. There are no known direct sources of chemical contaminants to Siskiwit Lake on Isle Royale; however, several toxic chemicals have been detected in the lake's waters. The discovery of these compounds, such as toxaphene which was used extensively in the southern United States but very little in the Great Lakes basin, is a strong indication that toxic chemicals are transported through the air to the region. Data suggest that normal weather patterns bring pollutants to rest in the Great Lakes from as far away as Mexico and Central America.

Certain toxic compounds are of particular concern in aquatic ecosystems because they are persistent (do not break down readily in the environment); only slightly soluble in water, but soluble in lipid (fat) cells; and bioconcentrate. Compounds that bioconcentrate accumulate in the fat cells of sensitive fish species and may reach concentrations that are thousands of times the level in surrounding water. Accumulation can occur through the food chain, leading to high concentrations in fish and birds; and through physical processes, settling in bottom sediments.

Bioaccumulation in aquatic systems of toxic substances deposited from the air creates new avenues of human exposure which should be considered in control strategies. Nearly three million people fish in the Great Lakes and most anglers eat their catch. In addition to direct inhalation, consumption of fish and contact with contaminated water and sediments are significant vectors of human exposure to toxic compounds from air pollution. Bioaccumulation also multiplies the impact of air toxics on the environment itself, especially its biological diversity.

In 1985 the International Joint Commission adopted a list of persistent toxic Critical Pollutants which are widespread throughout the Great Lakes ecosystem. In the 1987 Report on Great Lakes Water Quality, the IJC Water Quality Board describes these Critical Pollutants as "capable of producing adverse, often irreversible effects in a wide range of mammalian and aquatic species. -Because of their ability to bioconcentrate and to bioaccumulate up the food chain, the recognized threat to human health and the aquatic ecosystem is significantly enhanced. The concern is further exacerbated because, despite regulatory controls and reductions in ecosystem concentrations for many, all

eleven persist at unacceptable levels." Further, "Atmospheric transport and deposition into the Great Lakes basin, either directly onto the water surface or indirectly onto the drainage basin with subsequent transport, have been clearly demonstrated."

The need for national and international controls has become evident. The International Joint Commission Great Lakes Water Quality Board's 1987 Report on Great Lakes Water Quality concludes that "Atmospheric transport of persistent and hazardous toxic substances affects all aspects of the global ecosystem". Further, "Since atmospheric transport and deposition of contaminants contributes to the overall degradation of the Great Lakes ecosystem, the Water Quality Board recommends that: Protection of the Great Lakes ecosystem be incorporated into legislation, executive agreements, and regulatory programs to control emissions of persistent toxic substances into the atmosphere".

These concerns are not exclusive to the Great Lakes basin, nor are they limited to the large lakes. The toxic substances threatening the Great Lakes are not confined to the region, they are evident throughout the United States. In addition to the Governors' initiatives for Great Lakes protection, several individual states have also identified pollutants in inland lakes at a level of concern warranting fish consumption advisories. As an example, Michigan has issued fish consumption advisories for all of Michigan's inland lakes because of mercury levels found in certain fish species.

Atmospheric inputs and resulting bioaccumulation in aquatic systems adds a dimension to the air pollution problem that cannot be ignored.

Recommendations

While we applaud the control technology approach incorporated in S. 816, we strongly urge that the Clean Air Act amendments address the following points:

1. Special source size cut-offs should be considered for International Joint Commission (IJC) Critical Pollutants.

Sources emitting much less than 10 tons per year of IJC Critical Pollutants must be controlled. Low level emissions from a multitude of individual air emission sources can collectively contribute significant pollutant loadings to aquatic ecosystems. Therefore, minimum source size cut-offs (threshold emission rates) to identify source categories subject to control technology standards should be established to reflect that these pollutants persist and bioaccumulate in the environment. These source categories should be evaluated using the maximum achievable control approach specified for major sources in S. 816. Evaluation for maximum achievable controls should be required for considerably smaller emission sources than if inhalation was the only route of exposure of concern for humans.

We have considered potential implications of using lower thresholds and can provide our analysis which reflects an estimation of source categories which could be addressed in appropriate Maximum Achievable Control Technology evaluations. For example, when considering polychlorinated dibenzodioxins and polychlorinated dibenzofurans (dioxins and furans) an appropriate emission level should be in fractions of a pound per year, not tons per year. An

emission number for these compounds should be established which would include a review for hazardous waste incinerators, sewage sludge incinerators, municipal waste incinerators, etc., but would not include source categories of very low emission rates such as residential and commercial combustion sources.

2. Critical Pollutants should receive priority for standard setting and compliance schedules.

Maximum achievable controls should be required for all source categories of the seven IJC Critical Pollutants which have been identified to date as having known air point sources within the United States. IJC Critical Pollutant classes identified to date include alkylated lead compounds, benzo(a)pyrene, mercury, hexachlorobenzene, polychlorinated biphenyls (PCBs), 2,3,7,8-tetrachlorodibenzofuran, and 2,3,7,8-tetrachlorodibenzo-p-dioxin.

Source categories of these pollutants should be included in the initial group of categories listed for evaluation for emission standard development. After development of these standards, new sources should be required to comply with the emission standards upon construction and existing sources should be required to comply not later than 3 years after the effective date of the standards.

3. Evaluation of residual risks should incorporate indirect routes of exposure on an accelerated schedule.

As discussed above, indirect routes of exposure such as fish consumption are of concern for human health protection. After the application of emission

controls, evaluation of the remaining risk which incorporates both direct and indirect routes of exposure should be conducted within 3 years to determine if further reductions are necessary. Within two years of review, standards shall be revised where significant risk remains.

4. Emission inventory database development should be required.

Several pollutant classes are of potential concern for aquatic ecosystem impacts. An emission inventory database is needed in order to properly determine emission sources, emission levels to the atmosphere and resultant contributions to loadings to aquatic systems, and the effectiveness of control measures.

In closing, the Great Lakes Environmental Administrators are encouraged by the serious attention that air toxic compounds have received in recent months. The Environmental Administrators urge you to integrate the effects of bioaccumulation in aquatic systems in control strategies within this legislation. It is a critical yet too easily neglected dimension of the problem affecting fragile ecosystems and the health of millions of residents in the heavily populated areas of the Great Lakes basin.

Thank you.

Testimony of David D. Doniger
 Senior Attorney, Natural Resources Defense Council
 on behalf of the National Clean Air Coalition
 before the
 Subcommittee on Environmental Protection
 Committee on Environment and Public Works
 United States Senate
 on
 S.816, the Toxics Release Prevention Act of 1989

September 21, 1989

Mr. Chairman and members of the Subcommittee, I am David Doniger, and I am a senior attorney for the Natural Resources Defense Council (NRDC), a national organization with more than 115,000 members dedicated to the protection of public health and the natural environment. I am pleased to testify today for the 30 member organizations of the National Clean Air Coalition on the serious public health and environmental hazards posed by toxic air pollution, and on the various legislative proposals that have been put forward to curb this pollution.

Mr. Chairman, a toxic cloud hangs over America. Major chemical producers and users told the Environmental Protection Agency last year that they dumped 2.7 billion pounds of toxic chemicals into the air that our people must breathe, during "routine" operations in 1987. At least a comparable amount comes from millions of cars, trucks, and buses, and smaller industrial and commercial sources. The Bush Administration puts the cancer death toll from "routine" emissions of just some of these chemicals at 1500 to 3000 people each year.

Last June, NRDC released a report on 1987 emissions of just 11 chemicals that EPA classifies as known or probable carcinogens. Our study, entitled "A Who's Who of American Toxic Air Polluters," is a guide to air emissions of these chemicals by more than 1500 factories in 46 states which reported under the Community Right to Know Act of 1986. More than 360 million pounds of air emissions of these cancer-causing chemicals were reported under that law.

To the cancer deaths must be added the toll of death and injury when "routine" operations give way to chemical accidents. More than 11,000 chemical accidents have already occurred in the 1980s, killing 309 people, injuring more than 11,300 others, and requiring the evacuation of nearly a half million people from their homes, schools, and businesses. What's more, EPA reports that there have been 17 chemical accidents in the U.S. with the potential to surpass the catastrophe in Bhopal, India, where the toxic gas cloud from a Union Carbide plant killed more than 3000 people. But for the grace of good weather and good luck, even more people could have died here.

In nearly 19 years since the Clean Air Act of 1970 was enacted, EPA has done extraordinarily little to protect the American people and their environment from toxic air pollutants. Under Section 112 of the Act, EPA has set highly compromised emission standards for just a fraction of the industrial sources -- just seven cancer-causing air pollutants. Under Section 202, EPA has issued modest standards for only one motor vehicle pollutant beyond the three Congress controls itself -- diesel particulate emissions. Despite a mandate to test and regulate dangerous fuel constituents and additives under Section 211, the only major additive EPA has even partially regulated is lead, which is still in gasoline.

It is time to stop treating the atmosphere as the largest hazardous waste dump of them all. The fact is that people receive their greatest toxic chemical exposure through the air, more than from toxic waste dumps, polluted drinking water, or contaminated food. People drink two liters of water per day, but they breathe 15,000-20,000 liters of air per day. You have some choice over the water you drink, but you have no choice over the air you breathe. Recent legislation for hazardous wastes, drinking water, and surface water pollution has markedly strengthened control of toxic pollutants in these media. It is past time to tighten the net on toxic pollutants in the air.

Mr. Chairman, everyone who has put forward a legislative proposal, including President Bush, agrees that toxic air pollution is a major public health hazard. As the President said on June 12: "People who live near industrial facilities should not have to fear for their health." There is broad agreement that the existing law's provisions on toxic air pollution must be strengthened in the Clean Air Act amendments being considered this year.

This Committee can take pride in the fact that its efforts on air toxics, starting last year, provided the structure that all other bills start with. For example, this Committee's legislation was the first to break the logjam at EPA over the listing of toxic chemicals. It would list by law some 220 "hazardous air pollutants." The listing of these pollutants would stop further shilly-shallying over the listing process.

There are, however, great differences in the scope and strength of the legislative proposals on toxic air pollution. The Administration's bill, S.1490, is the most deficient. Except for a token board with insignificant powers and no independence, the Administration bill ignores the prevention of chemical accidents which occur literally on a daily basis. The bill entirely ignores the danger of airborne toxic chemicals to environmental resources such as the Great Lakes. It contains no provisions at all for controlling toxic emissions from motor

vehicles, and it provides only the barest and most discretionary hint of authority to deal with smaller stationary sources.

Even in the area it does address -- major industrial emission sources -- health protection would be fatally compromised. Half the source categories of air toxics need not even be regulated. And while the National Clean Air Coalition strongly agrees with the President's statement of objective -- i.e., that "[t]he very best control technology we have will determine the standards we set for these plants" -- the actual language sent up in S. 1490 for the phase-one technology-based standards does not accomplish this objective. In phase two of the program, health protection takes a back seat to cost-benefit analysis. In fact, the President's proposal is weaker in significant respects than H.R. 4, which was drafted by the Reagan EPA last year.

Unfortunately, S.816 also has very significant flaws. While it addresses some of the areas the Administration bill ignores and thus offers the necessary structure to work from, the National Clean Air Coalition believes the bill does not, in its present form, provide adequate and timely protection for public health and the environment. The Coalition wants to work with the Committee to make the following improvements in S.816:

- o The timetables need to be accelerated. The public should not have to wait 5-13 years for compliance with the first-phase technology standards, nor for 10-23 years for the second-phase standards to reduce remaining health risks.
- o The technology standards need a true "floor" -- a minimum performance requirement linked to the best controlled sources already operating.
- o A deadline must be set for meeting the 1-in-1,000,000 risk standard for cancer-causing pollutants. Further, the bill should include the objective of eliminating cancer-causing emissions.
- o Provisions for cleaning up the "toxic soup" in urban areas need defined health objectives, control requirements, and deadlines. These should cover both motor vehicles and the so-called "area" sources, which together account for as much as 75% of the cancers from toxic air pollution. Without these specifics, experience shows that little will be accomplished by EPA.

The representative from the National Wildlife Federation has already given the Coalition's views on the bill's chemical accident provisions.

We urge the Committee, when considering how to address these problems, to closely examine H.R. 2585, introduced by the late Rep. Mickey Leland and Rep. Guy Molinari. While that bill is not without need of improvement, its key provisions meet the shortcomings we have identified in S.816, as well as S.1490.

In the remainder of this testimony I will give a detailed analysis of the main deficiencies in the air toxics provisions of the Administration bill, S.1490. I will then return to the improvements in S.816 that the National Clean Air Coalition believes are necessary in order for that bill to provide adequate and timely protection for public health and the environment. Because time is limited and because I have testified before you several times in the past on the basic dimensions of the toxic air pollution threat, I have included a summary of health and environmental harms from air toxics in an attachment for the record.

A. The Administration Bill (S. 1490)

Title III of the Administration bill is not a credible or effective program to protect the American people and their environment from toxic air pollution. The bill attacks only a fraction of the problem. It does not require controls on sources of 75% of the cancer cases caused by air toxics: motor vehicles and so-called "area" sources. For major industrial sources, public health protection takes the back seat to cost-benefit analysis in an agonizingly slow 25 year program that, in the end, is required to cover only half the toxic-emitting categories. The bill does nothing to protect the environment from air toxics. And except for a token Chemical Safety Board with insignificant powers and no independence, the bill entirely ignores the prevention of chemical accidents.

1. Toxic Emissions from Motor Vehicles

Motor vehicle emissions account for about 50% of the 1500-3000 cancer deaths per year attributed to toxic air pollution, according to EPA. The Bush bill contains no control measures for toxic motor vehicle emissions.

2. Toxic Emissions from Smaller Industrial and Commercial Sources (So-Called "Area" Sources)

Another 25% of the cancer deaths come from toxic emissions from smaller industrial and commercial sources, according to EPA. These include gas stations, solvent users, chrome platers, etc. The Bush does not require controls on these sources. EPA is given complete discretion to control only those source types it finds "warrant" regulation. Based on past experience, under a mandate this general and discretionary, virtually nothing will

happen. If EPA does choose to regulate an area source category, it cannot require the very best technology, only "generally available control technology or management practices."

3. No Protection for the Environment

Despite the fact that major ecosystems like the Great Lakes receive the majority of their toxic pollutant burden from the air, the bill lacks even discretionary authority to protect against the environmental harms of toxic air pollutants.

4. Token Accident Prevention Measures

Except for a token Chemical Safety Board, the bill contains no requirements for preventing the daily occurrence of chemical accidents: no measures for leak prevention, hazard assessments, emergency response, or accident control regulations. The bill provides for a Safety Board consisting merely of such ad hoc "panels" as EPA, in its discretion, chooses to assemble to investigate particular accidents. Unlike the National Transportation Safety Board, this Board lacks the independence, capabilities, and resources necessary to assuring public safety and public confidence.

5. Toxic Emissions from Major Industry

The Administration bill is exclusively concerned with controlling toxic emissions from major industrial sources. Major industrial sources are responsible for 25% of the total cancer deaths and the highest risk to individuals. But the bill's provisions in this area have major flaws:

a. Phase one "MACT" standards don't require "the very best technology". The President promised on June 12 that: "The very best technology we have will determine the standards we set for these plants" in phase one of the program to control toxic air pollutants. But the bill does not require either new or existing sources to use "the very best technology."

The bill begins hopefully by stating that standards for new sources "shall not be less stringent than the emission control achieved in practice by the best controlled similar source." (Section 301(d)(3). For existing sources this benchmark is watered down by use of the plural -- "best controlled similar sources.") But hopes for a meaningful floor are dashed in the next sentence, which grants the Administrator blanket discretion to "take into account energy, environmental, and economic impacts and other costs, as well as any other factors the Administrator deems appropriate."

Under the current law language like this consistently has been used by EPA and OMB to justify adopting standards weaker

than the best controls already in use by the leading sources. Thus, the language contradicts the President's promise that "the very best technology" would be used against toxic air emissions.

b. Phase two "unreasonable risk" standards would put cost-benefit analysis over public health protection. Under current law standards must "provide an ample margin of safety to protect the public health." The President's bill abandons the goal of public health protection even in phase two standards. Nearly two decades after enactment, EPA "may" set second phase standards, if it finds an "unreasonable risk to public health taking into account the cost and technical feasibility as well as the health based risks of such standards."

"Unreasonable risk" is a code phrase for cost-benefit analysis, in which lives lost and health destroyed are reduced to dollar values and deemed expendable if unequal to the costs of controlling toxic pollution. The cost-benefit message is redundantly driven home by the following language on costs and feasibility.

The Bush bill thus provides even less public health protection than H.R. 4, the air toxics bill drafted by the Reagan EPA last year. That bill required phase two standards whenever the health risks were deemed "significant" -- a term that does not include cost-benefit considerations. (Even "significant" risk allows too large a loophole, however. The final bill should specify a deadline for reducing all persons' lifetime cancer risks from cancer-causing air pollutants below one chance in 1,000,000.)

c. Toxic emissions would continue unabated for a quarter century. Existing sources would have as long as 10-18 years from enactment to meet phase one standards. This is even longer than the schedule in H.R. 4, the Reagan EPA's bill:

- o EPA gets 2-10 years to promulgate phase one standards,
- o Sources get 3 more years for compliance, and
- o Sources get 5 more years delay if they installed any controls any time in the preceding 8-10 years -- even just the most lenient "Reasonably Available Control Technology" (RACT).

In phase two, existing sources are allowed 17-25 years from enactment:

- o EPA gets 9 years from promulgation of phase one standards to decide if there is an "unreasonable risk,"
- o EPA gets 2 more years to set the phase two standard,
- o Sources get 7 more years to comply.

The bill lacks any default or "hammer" provisions to keep EPA on even this agonizingly slow schedule. Compliance will slip even further if EPA falls behind in issuing standards.

d. Half the industrial source types can go uncontrolled. All categories of major toxics sources would have to be listed, but only half are required to be regulated. EPA has total discretion whether to control emissions from any sources in the second half.

Further, EPA can drop a category (even from the first half) if it decides the sources are already "adequately controlled" under any other federal law. The bill provides no health-based or even technology-based criteria for these exemption decisions. This is a retreat from current law, which provides (for radionuclides) that EPA may rely on other laws only if they assure both equal health protection and equal citizen enforcement rights.

e. Open-ended extensions.

(i) Individual sources and whole industrial categories can get exemptions by claiming they cause only "negligible" risks. The bill sets no health-based criteria for what is "negligible."

(ii) The bill broadens existing law's national security exemption. Currently, the President must find that technology is not available for compliance and that "the operation of the facility" is specifically required for reasons of national security. Under the bill only a vague allegation that exemptions "would be in the national security interest" is required.

f. Restrictive listing criteria. Chemicals can be removed from the toxic pollutant list if there isn't "sufficient evidence" of harm "in humans." This language could be interpreted to restrict the well-established use of animal data where human data are lacking.

g. Further special exemptions.

Radionuclides. The bill would let EPA set standards for radionuclides in the unenforceable form of "dose" standards, rather than emission limitations or work practice requirements. This weakens current law to ratify a special loophole extracted from EPA by the Department of Energy and the OMB for nuclear weapons production facilities. No other industry is allowed this loophole.

Electric utilities. Radionuclides from fossil-fuel fired boilers are estimated by EPA to cause one cancer death every 456

days. Other toxic emissions (trace metals, organic compounds) add to this toll. Yet the Bush bill gives utilities a special loophole by barring any control of their toxic emissions until EPA conducts a three-year study and reports to Congress. A virtual OMB veto is provided, as OMB must approve the report before it can be sent to Congress.

B. The Toxics Release Prevention Act (S.816)

While S.816 certainly represents a more serious effort to address toxic air pollution than the Administration bill, it still does not provide adequate and timely protection for public health and the environment. The National Clean Air Coalition would like to work with the Committee to address these flaws. As the Committee has already heard the Coalition's views on the accident prevention provisions, I will address the provisions for control of so-called "routine" emissions, from large sources, area sources, and motor vehicles.

Earlier, I identified four major areas where improvements are needed: (1) shorter deadlines, (2) a true "floor" for technology standards, (3) greater protection from cancer risks, and (4) more specifics in the control measures for the toxic urban soup. Let me go into these areas in more detail.

1. The Timetables Need To Be Accelerated

The timetables for meeting the phase-one and phase-two standards need to be accelerated. The public should not have to wait 5-13 years for compliance with the first-phase technology standards, nor for 10-23 years just to reach a 1-in-10,000 risk level in the second-phase. Twenty-three years is almost time enough for children born this year to grow up and run for Congress. The Coalition urges you to reduce the delays in two specific ways:

First, it should not be necessary for EPA to take 10 years to issue the first-round technology standards. This period can be trimmed to a maximum of 8 years.

Second, we do not see the logic in giving EPA five years after technology standards are set to issue the 1-in-10,000 and 1-in-1,000,000 standards for carcinogens, or the "ample margin of safety" standard for threshold pollutants. These steps can and should be simultaneous with the issuance of the technology standards. The determination of the emission rates needed to satisfy those health tests is no easier or harder at the time the technology standards are set. The schedule for setting the technology standards allows plenty of time to perform the necessary risk assessments.

If the Committee adopts these recommendations, the maximum 23 year period for reaching the 1-in-10,000 standard can be cut to 16 years. We think, as we will discuss below, that this is enough time to meet even the 1-in-1,000,000 standard. This is still a very long time for protecting public health from cancer-causing air pollutants.

EPA's August decisions on benzene, troubling as they are in many respects, tell us something very important about the appropriate timetables for new legislation. Despite exaggerated worries expressed last year, EPA found that meeting standards approaching 1-in-10,000 risk over the two-year compliance timeframe of the current law would not have any dire economic impacts. EPA found that the standards for coke oven by-product plants and for storage tanks were affordable within this timeframe. In fact, the standards were not even expensive enough to trigger OMB review under the regulatory review executive order.

This strongly supports a much more ambitious timeframe for reaching the 1-in-10,000 mark. If 1-in-10,000 standards are feasible within two years, then surely the deadlines in S. 816 can be shortened. There is no reason to allow 10 to 23 years to meet this modest risk level. In addition, if 1-in-10,000 standards are attainable in the short run, then there is no reason why more protective standards meeting the 1-in-1,000,000 level cannot be attained with 5 to 10 years more leadtime.

2. The Technology Standards Need A True "Floor"

The phase-one "BACT" standards need a true "floor" -- a minimum performance requirement linked to the best controlled sources already operating. All experience with technology-based standard-setting for the last 19 years shows that EPA lets the standards degrade to levels far weaker than the best performing sources.

Consider, for example, EPA's definition of "Best Available Technology" ("BAT") for coke ovens. EPA expressly intended "BAT" for coke ovens to be a lowest common denominator standard; it is an emission rate based on "the 95 percent confidence limit for the worst performing battery with BAT technology." This level of control is forecasted to achieve only a 37 percent reduction in overall coke oven emissions.¹

¹ See Industrial Economics, Inc., "Impacts on Integrated Steel Producers Resulting from Regulation of Emissions from Wet-Coal Charged By-Product Coke Oven Batteries," prepared for Office of Policy Analysis, Office of Air and Radiation, EPA (August 1989), p. 1-32.

The bill does not include a floor for these standards. Instead, it ordains a so-called "top-down" procedure, under which EPA must examine the best levels of control first and explain its reasons for rejecting them before moving to progressively weaker standards. With respect to the drafters' good intentions, this procedure will not work. EPA already routinely sets forth three or four options for each technology standard, routinely throws out the best and the worst, and settles on the one in the middle. It is largely a straw-man exercise. Nothing in the bill's top-down procedure will effectively prevent EPA from continuing to consistently reject the best control levels.

There does not seem to be a problem with the notion that, for new sources, the floor for the standards should be based on the best controlled source already operating. The Coalition believes the same approach should be used for existing and modified sources, with the proviso, as in H.R. 2585, that the top 10 percent of the field might be thrown out, if necessary.

3. Set a Deadline For Meeting the 1-in-1,000,000 Standard and Include the Objective of Eliminating Cancer-Causing Emissions

The bill needs a firm deadline for meeting the 1-in-1,000,000 risk standard for cancer-causing pollutants. Further, the bill should include the objective of eventually eliminating cancer-causing emissions.

One-in-1,000,000 is EPA's own standard for the maximum acceptable lifetime cancer risk for pesticide residues on food, stated just last October.² We fail to see why cancer risks that are tens, hundreds, or even thousands of times higher should be viewed as tolerable when brought to you by chemicals in the air rather than by chemicals on food.

S.816 includes a 1-in-1,000,000 standard, but fails to provide a deadline for attaining it. Instead, sources can obtain an unlimited number of extensions from EPA. Based on all experience, we have to conclude that EPA will be virtually incapable of "just saying no" to extension requests. The requirement that sources show the show use of "all available technology and operational controls" and the government's power to order research and development on better controls will produce little concrete results.

² See 53 Fed. Reg. 41104, 41112-15 (Oct. 19, 1988). We do not agree that EPA has legal authority to allow these risks in food, given the Delaney Clause to the Food, Drug, and Cosmetic Act. EPA's policy stand on a 1-in-1,000,000 safety standard for pesticides is nonetheless highly relevant as a statement of the maximum cancer risk that the Agency considers acceptable.

On the other hand, we have every reason to expect more serious efforts and investments into new processes and pollution controls if there is a definite deadline for meeting the 1-in-1,000,000 standard. Congress can always adjust the deadline later if sources demonstrate that they need more time, despite having made serious control efforts.

Some will say this is an issue for the EPA, not Congress. But the Coalition asks why shouldn't there be a limit on how long an unelected administrative agency can allow an industry to put off protection of public health. Why shouldn't sources have to come back to the people's elected representatives for more time?

The National Clean Air Coalition believes the law should continue to specify the objective of totally eliminating cancer-causing emissions. That was the original intent of the current requirement for protecting public health "with an ample margin of safety." An objective of eliminating cancer-causing emissions is hardly a radical policy. It is the official corporate policy of at least two major companies, Monsanto and Union Carbide, which publicly adopted the goal of zero emissions (Union Carbide for carcinogens, Monsanto for all SARA §313 air pollutants). We urge you to add an "objective" of zero emissions to the bill. With major companies already adopting this objective, there is no reason why Congress should not do likewise.

The Coalition emphasizes the need to keep risk assessment precautionary and conservative. The most articulate spokesman for "risk management," former Administrator William Ruckelshaus, once conceded that you wouldn't try to put a man into orbit on the strength of these equations. We must be very cautious, then, when using such equations for life or death decisions down here on the ground.

We support the provisions in the bill that keep the focus of decisions on the most exposed individuals. This is essential in order to reverse the most galling proposition in EPA's "risk management" policy of recent years: The notion that only populations, not individuals, matter. EPA has been all too willing to leave groups of highly exposed individuals unprotected -- trapped in islands of risk -- on the grounds that "not enough" people are getting cancer overall. The National Clean Air Coalition rejects a policy under which the protection an individual can expect depends on the number of people in the same boat with him. What kind of a government policy doles out life and death depending on population density?

4. Make the "Urban Soup" Provisions More Specific

The bill's provisions for cleaning up the "toxic soup" in urban areas need defined health objectives, control requirements,

and deadlines. These should cover both motor vehicles (which account for some 50% of the cancers from toxic air pollution, according to EPA) and the so-called "area" sources (which account for another 25%). The combination of emissions from industrial, commercial, and mobile sources creates high cancer risks for tens of millions of people. A study by EPA of cancer risks due to the urban soup in five cities found an average of six cancer cases per year in each million people, with the incidence in specific cities ranging from 1 to 23 cases per million. Curiously, the EPA report declines to name the five cities, referring to them as "City A," "City B," etc.³

But without specifics, experience shows that little will be accomplished by EPA. As written, the area source program allows EPA too much discretion, and therefore guarantees little will be accomplished. It is likely to turn into purely a planning exercise resulting in little actual emission control.

Governors have to monitor for hazardous pollutants, and EPA has to come up with a comprehensive control strategy. But the provisions fail to specify the pollutants which have to be monitored or controlled; the degree of control required of the Administrator's control program (other than to "substantially reduce the public health risks"); and any deadline for implementation of the control strategy.

We urge you to make the requirements meaningfully specific. The EPA five-city study cited above concluded that, on average, mobile sources account for 55 percent of the cancer risk from air toxics, with emissions of benzene, 1,3-butadiene, formaldehyde, and polycyclic organic matter (from diesel and gasoline particulate) figuring most prominently. These pollutants should be subject to emission standards and fuel quality requirements, as in H.R. 2585.

Other important urban source categories are chrome platers, industrial and comfort cooling towers (emitting chromium), solvent usage, woodsmoke, gasoline marketing, hospital sterilization (emitting ethylene oxide), incinerators, and sewage treatment plants. We urge you to adopt the requirement found in H.R. 2585 for the issuance of BACT emission standards for a specific number of such source categories, on a definite schedule.

As mentioned earlier, I am leaving testimony on the subject of accident prevention to my colleague from the National Wildlife

³ EPA, Office of Air Quality Planning and Standards, "Analysis of Air Toxics Emissions, Exposures, Cancer Risks, and Controllability in Five Urban Areas," p. iii (Draft, May 1989).

Federation. There are a number of smaller suggestions for improvements that we will convey to staff.

* * *

The threat to public health and the environment from toxic air pollution is very serious and demands the attention of Congress. The American people are fed up with this assault on their skies and their health. They are demanding action to control pollution like never before. In a recent Washington Post/ABC News poll, protecting the environment ranked as the public's second highest priority, topped only by the war on drugs.

Consequently, the National Clean Air Coalition urges the Subcommittee to improve S.816 with the additions and changes we have suggested above.

I will be happy to answer any questions you may have.

APPENDIX: THE DIMENSIONS OF THE TOXIC AIR POLLUTION THREAT

This appendix presents a brief review for the record the serious dangers to public health and the environment posed by toxic air pollutants. As the witness from the National Wildlife Federation has already addressed chemical accidents, I will concentrate on the health threats from the so-called "routine" emissions from industrial facilities, and on the urban toxic soup that most Americans are forced to breathe.

Toxic air emissions take an annual toll of thousands of cases of cancer, acute illness, and chronic disease. Many of these pollutants can kill or injure immediately. Others cause death or serious illness after years of exposure to even low concentrations.

Virtually every American is exposed. Tens of millions of people live near chemical plants, oil refineries, smelters, coke ovens, and other major industrial sources of toxic pollutants. These facilities pose the greatest danger to the most exposed persons in surrounding neighborhoods. Well over 100 million people living in urbanized areas breathe a deadly "chemical soup" of known and suspected toxic chemicals, from which they are not protected by the six ambient air quality standards. And hundreds of miles downwind from pollution sources, a toxic rain contaminates major ecosystems like the Great Lakes, causing severe damage to fish and aquatic resources, and indirectly endangering public health.

Let me give you just a few more statistics from NRDC's "Who's Who" on cancer-causing chemical emissions that I mentioned before.⁴ Our report looked at 1987 releases, as reported by industry, of the following chemicals:

- Acrylonitrile
- 1,3-Butadiene
- Cadmium and cadmium compounds
- Carbon tetrachloride
- Chloroform
- Chromium and chromium compounds
- Ethylene dichloride
- Ethylene oxide
- Methylene chloride
- Perchloroethylene
- Trichloroethylene

⁴ Natural Resources Defense Council, "A Who's Who of American Toxic Air Polluters: A Guide to More Than 1500 Factories in 46 States Emitting Cancer-Causing Chemicals" (Washington, D.C., June 19, 1989).

These are chemicals that EPA classified as either known or probable human carcinogens in 1985.⁵ EPA stated in 1985 that it intended to regulate 10 of these as hazardous air pollutants under Section 112 of the Clean Air Act,⁶ but as of today not a single one of these pollutants has even been listed as hazardous, let alone subjected to federal regulation.

The NRDC report identifies more than 1500 large sources of these 11 chemicals, in 46 states plus Puerto Rico and the Virgin Islands. For nine of these substances, the vast majority of releases to the environment are releases to the air. The greatest emissions of a single carcinogen in the 1987 Right to Know database came from the Eastman Kodak Company in Rochester, New York, which reported emitting 8,920,000 pounds of methylene chloride into the air. Thirty facilities reported emissions of one million pounds or more of a single carcinogen. Sixty-two plants reported emissions between 500,000 and 1,000,000 pounds.

Of the 20 largest emission sources for each chemical, the single most startling fact is that between 25 and 100 percent of the sources (depending on the chemical) did not report the use of any end-of-pipe emission controls.

According to the Bush Administration, toxic emissions from major industrial facilities, as well as the urban soup caused by motor vehicle and smaller stationary source toxic emissions, is causing 1500-3000 cancer deaths in the U.S. each year.

In areas around major industrial sources, the cancer danger can be shockingly high. According to EPA, the most exposed persons living near certain steel facilities in Pittsburgh have a 1-in-55 chance of getting cancer over their lifetime from coke oven emissions. More than 500 coke oven neighbors have a better than 1-in-100 chance of getting cancer as a result of coke oven emissions; 23,000 people have a better than 1-in-1000 chance. EPA has stated that the most exposed persons living near underground uranium mines bear a chance of contracting fatal

⁵ The hexavalent form of chromium was classified as a known human carcinogens. All of the others, except perchloroethylene, were classified as probable human carcinogens. Perchloroethylene was classified as a possible human carcinogen "with a high likelihood that it will be considered a 'probable human carcinogen'" based on the most recent scientific evidence that had recently become available. See pages 8-11 of the NRDC report for citations.

⁶ Over the opposition of state and local environmental officials, as well as NRDC, EPA "referred" one of the pollutants (acrylonitrile) for a "pilot program" of regulation by states only.

cancer from radionuclide emissions higher than 1-in-100 even after compliance with the EPA standard issued in 1985. Preliminary EPA data made public earlier this year identify as many as 200 facilities where the most exposed plant neighbors may bear lifetime cancer risks greater than 1-in-1000.

Toxic pollution is a familiar subject in many heavily industrialized areas with large or multiple chemical plants: the Kanawha Valley in West Virginia; Richmond, California; the Geismar and Saint Gabriel communities in Southern Louisiana and other areas along the Gulf Coast; portions of northern New Jersey; and many other places as well. But the same story can be told for many areas which are not normally thought of as home to toxic chemical sources; very large sources of cancer-causing emissions are found in such states as Arkansas, Idaho, Iowa, Kansas, Maine, Minnesota, Nebraska, North Carolina, Oklahoma, Oregon, South Carolina, Utah, and Virginia.

Even in urban areas away from large industrial complexes, the chemical soup of toxic air pollutants also creates high cancer risks. The combination of emissions from industrial, commercial, and mobile sources creates high cancer risks for tens of millions of people. A study by EPA of cancer risks due to the urban soup in five cities found an average of six cancer cases per year in each million people, with the incidence in specific cities ranging from 1 to 23 cases per million. Curiously, the EPA report declines to name the five cities, referring to them as "City A," "City B," etc.⁷

The EPA study further states that lifetime cancer risk for average individuals ranges from about 1-in-10,000 to 1-in-1000. The study adds: "Note that these risks are not maximum individual risks, which can be as high as 10^{-2} [1-in-100] near some large point sources."⁸

More than half of the urban cancer risk comes mobile sources. The EPA five-city study concluded that on average mobile sources account for 55 percent of the cancer risk, with emissions of benzene, 1,3-butadiene, formaldehyde, and polycyclic organic matter (from diesel and gasoline particulate) figuring most prominently. Other important source categories are chrome platers, industrial and comfort cooling towers (emitting chromium), solvent usage, woodsmoke, gasoline marketing, hospital

⁷ EPA, Office of Air Quality Planning and Standards, "Analysis of Air Toxics Emissions, Exposures, Cancer Risks, and Controllability in Five Urban Areas," p. iii (Draft, May 1989).

⁸ Id. at p. 39.

sterilization (emitting ethylene oxide), incinerators, and sewage treatment plants.

Toxic air pollutants cause other serious chronic diseases:

- o Lead causes severe neurological disorders, especially in children -- learning disabilities, behavioral problems, hyperactivity, reduced IQ, decreased school performance. Recent research has also demonstrated that lead causes dangerous high blood pressure conditions in adults.
- o Mercury, inhaled as a vapor or ingested in its methylated form, is linked to a wide range of serious neurological disorders. Methyl mercury accumulates in fish and other species after being deposited in lakes and rivers via air and water pollution.



Natural Resources
Defense Council

1350 New York Ave., N.W.
Washington, DC 20005
202 783-7800
FAX 202 783-5917

October 19, 1989

The Honorable Max Baucus
U.S. Senate
706 Senate Hart Office Building
Washington, DC 20510

Dear Senator Baucus:

In my testimony on toxic air pollution on September 21, 1989, I promised to send up an article from the New York Times on the promise of the new "direct steelmaking" technology and concern that the steel industry risks becoming uncompetitive again.

Since then, I completed a letter on the same subject to Rep. Terry Bruce. The New York Times article is attached to this letter. I believe members of the Committee will find these items of interest.

Thank you for keeping the record open for these materials.

Sincerely

David Doniger

David D. Doniger
Senior Attorney

DDD/11d

cc: Members, Environment & Public Works Committee

100% Recycled Paper



New York Office:
40 West 20th Street
New York, New York 10011
212 727-2700
FAX 212 727-1773

Western Office:
90 New Montgomery
San Francisco, CA 94105
415 777-0220

Natural Resources
Defense Council
212 Merchant St.
Suite 203
Honolulu, HI 96813
808 533-1075



Natural Resources
Defense Council

1390 New York Ave., N.W.
Washington, DC 20005
202 783-7800
FAX 202 783-8917

September 26, 1989

Hon. Terry L. Bruce
House of Representatives
Congress of the United States
419 Cannon Building
Washington, DC 20515

Dear Rep. Bruce:

I am writing in response to your letter of June 30, 1989, regarding the control of toxic air pollutants from coke ovens.

As I stated in testimony before the subcommittee, NRDC believes that over the time span allowed by H.R. 2585, all industries in this country are capable of cleaning up their toxic air emissions so as to meet the health protection standard of that bill. Over this period, we believe all sources emitting cancer-causing pollutants will be able to reduce the lifetime cancer risk to the most exposed persons below one chance in a million. This will be true even for the steel industry.

H.R. 2585 initially allows between 10 and 16 years from enactment (depending on the year in which the technology standard for an industry is set) for a category of sources to comply with the one-in-one-million risk standard. Individual sources may have extensions of up to six years more, for a total of 16-22 years to meet that standard.

The steel industry can meet the health objective H.R. 2585 over this period by means of several strategies, including the adoption of new technology for steelmaking that eliminates the need for coke, called "direct steelmaking." With the adoption of this technology, coke ovens can be eliminated and the cancer risks therefrom can be reduced to zero.

The promise of this new technology was acknowledged by Mr. Milton Deaner, of the American Iron and Steel Institute (AISI), in his testimony. He said (at pp. 3-4):

"The industry is working today on development of a continuous direct steelmaking process that will eliminate the need for coke. In cooperation with the Department of Energy, a thirty million dollar program has been started to develop a continuous process that will eliminate the batch processing and be essentially a closed system, greatly

100% Recycled Paper

New York Office:
40 West 20th Street
New York, New York 10011
212 727-2700
FAX 212 727-1773

Western Office:
90 New Montgomery
San Francisco, CA 94105
415 777-0220

Natural Resources
Defense Council
212 Merchant St.
Suite 203
Honolulu, HI 96813
808 533-1075

Hon. Terry L. Bruce
September 26, 1989
Page 2

reducing the potential for pollution. That development, if successful, will solve the pollution problems of cokemaking."

To be sure, Mr. Deaner followed with a caution that the new process might not prove successful, and with the assertion (offered without explanation) that even if successful, the process could not be put into "widespread" use within the legislation's timeframe. Nonetheless, Mr. Deaner's acknowledgement that a way can be found to eliminate the cancer risk from coke ovens is a remarkable breath of fresh air.

Further information on this new technology is found in a report just completed for the Environmental Protection Agency.¹ The report states (at p. 1-22):

"Direct steelmaking is the production of steel from iron ore and coal (thus no coke ovens are required). While not yet available commercially, this technology is approaching the pilot stage in Europe, and is considered a priority research and development issue in Japan. The American Iron and Steel Institute (AISI) has expressed interest in developing a domestic research program, with the hopes of constructing a pilot scale plant in the early 1990's.

"There are two primary factors driving interest in direct steelmaking: (1) the desire to stay competitive in world markets (it is believed that direct steelmaking will be significantly less expensive than coke-based steelmaking); and (2) a desire to move away from the environmental problems associated with coke ovens."

In a recent New York Times article (August 7, 1989, copy attached), steel industry analysts underscored the need for the U.S. steel industry to develop direct steelmaking technology in order to remain competitive with European and Japanese firms that are aggressively pursuing this technology. These analysts sounded an alarm, however, that the U.S. steel industry's R&D investments, both in general and specifically in this technology, are lagging in comparison with foreign competitors. Thus, despite recent modernizations and the fact that the U.S. industry

¹ Industrial Economics, Inc., "Impacts on Integrated Steel Producers Resulting from Regulation of Emissions from Wet-Coal Charged By-Product Coke Oven Batteries," prepared for Office of Policy Analysis, Office of Air and Radiation, EPA (August 1989). I have enclosed the executive summary of this report.

Hon. Terry L. Bruce
 September 26, 1989
 Page 3

is currently enjoying high profit levels, the industry is running a serious risk of being uncompetitive in the future. As stated in the Times article:

"But industry experts warn that all the effort to catch up may go to waste unless American steelmakers find some way to increase their spending sharply on research and development. As things stand, according to a study by the University of Salford in Britain, the \$200 million that the Nippon Steel Corporation spends annually on research is more than the entire American steel industry spends."

The article continued: "One specific worry is underinvestment in research in 'direct steelmaking'...." Noting the plan, referred to by Mr. Deaner, for the American companies and the Energy Department to spend \$30 million over the next three years on this technology, the article said:

"By contrast, the Japanese steel industry has invested \$250 million in a similar project, and a consortium of European steel companies has already spent about \$100 million in the last three years working on such a process."

If this underinvestment continues, "the typical American steel plant is likely to become an industrial museum," according to Jonathan M. Aylen, senior professor of industrial economics at the University of Salford. He cited two advantages of the direct steelmaking technology, wholly apart from the benefit of eliminating coke oven emissions: lower maintenance costs and lower energy consumption. These will make conventional coke-based steel production uncompetitive.

Similar warnings were sounded by U.S. industry officials. Frank W. Luerksen, chairman of Inland Steel and president of the AISI, was quoted as saying: "I worry about the state of things 10 years from now and beyond the year 2000 as it relates to the quality of the research and development.... I worry that product innovations will occur more rapidly in other countries."

It seems clear, then, that the path to remain competitive and the path to protect the public from cancer-causing coke oven emissions are one and the same: aggressive development and deployment of the direct steelmaking technology. The two questions then are how quickly can this be accomplished, and what emission controls should be required on coke ovens in the intervening period?

The Industrial Economics study for EPA made two projections of leadtime for adopting the direct steelmaking technology.

Hon. Terry L. Bruce
September 26, 1989
Page 4

These projections were based simply on the rate at which two earlier technologies were adopted by the steel industry: continuous casting and basic oxygen furnaces (BOF). No faster adoption rate, driven by competitive or public health concerns (or both) was considered.

According to the study, using the average of the rates at which continuous casting and BOF technology were adopted: "By 2000 approximately eight percent of coke-based steelmaking capacity is displaced by this new technology; by 2010 38 percent; by 2020 83 percent; and by 2030 virtually all coke-based capacity has been replaced by direct steelmaking." Using the rate of adoption for BOF technology alone, "13 percent of coke-based steelmaking capacity is displaced by direct steelmaking by 2000, and 55 percent by 2010." See p. 1-23 and Exhibit 1-9, p. 1-24.

As noted above, however, the study did not consider any faster rate of adopting direct steelmaking technology, driven by competitive and public health concerns. There is no reason why future technological change in the steel industry is limited to the rate at which two older technologies were adopted. There is no reason why direct steelmaking cannot be adopted more quickly.

Indeed, if the forecasts of the industry experts and officials cited in the New York Times article are correct, then the competitive position of the U.S. steel industry will be in great jeopardy unless the development and deployment of direct steelmaking is greatly accelerated.

Turning to the legislation before you, assuming that coke ovens are included (as they should be) in the first group of source categories for which technology-based standards are set, H.R. 2585 allows 10 years before compliance is required by any source with the health protection standard. Some facilities will be converted to direct steelmaking within this time, even using the non-accelerated schedules of Industrial Economics.

H.R. 2585 allows other facilities extensions of up to six additional years, for a total of 16 years from enactment (2006, assuming enactment next year). If the steel industry adopts an accelerated schedule for development and deployment of direct steelmaking technology -- as it must to remain competitive with foreign competition -- then we are confident that all sources can be brought into compliance with the health protection standard within this 16 year period.

The other question is what control measures should be required in the technology-based standard that applies in the interim? First, it should be noted that demand for coke is

Hon. Terry L. Bruce
 September 26, 1989
 Page 5

falling sharply. Industrial Economics cites four factors already at work (apart from the expected displacement of coke ovens by direct steelmaking):

- (1) the steady decline (after accounting for business cycles) in U.S. demand for steel;
- (2) the continued growth of scrap-based steelmaking;
- (3) increased use of a technique called "pulverized coal injection," in which pulverized coal is injected directly into blast furnaces, cutting the need for coke; and
- (4) increased utilization of continuous casting, which increases the efficiency of steel production, reducing the demand for coke per ton of finished steel.

Based on these factors alone, Industrial Economics projects a 28 percent decline in coke demand by the year 2000, and a continued decline to zero as direct steelmaking proliferates. See pp. 1-19 through 1-25. An article in a recent issue of American Metal Marketer (Sept. 20, 1989) suggests that "pulverized coal injection" by itself may make possible an even larger reduction in coke demand. According to Mr. Max Sorenson, manager of raw materials and primary production for Inland Steel, European steel producers have already demonstrated that use of pulverized coal can reduce coke consumption by 25 percent. They are now said to have a goal 30-40 percent reduction in coke consumption by this means.

Industrial Economics notes that approximately one-half of current capacity will reach the retirement or rebuild point (30-40 years of age according to steel industry engineers) during the next decade. See p. 1-29. Thus, as demand drops, the industry has the opportunity to shut the oldest and most dangerous coke ovens first. Retired ovens, of course, need no emission control expenditures.

For the remaining ovens, EPA has looked at three options for the technology-based standard. The best of these options -- the one most likely to satisfy the definition of "BACT" in H.R. 2585 -- would achieve a 90 percent reduction in current levels of coke oven emissions.² Based on a "worst case" economic assessment,

² The terminology being employed within EPA is confusing. The most lenient level of control under consideration is called "BAT" (continued...)

Hon. Terry L. Bruce
 September 26, 1989
 Page 6

Industrial Economics projects that coke production costs will be increased by a maximum of seven percent, with less than a one percent increase in the cost of finished steel products. See Exhibit 1-15, p. 1-33; p. 1-37; and Exhibit 1-18, p. 1-38.

Unfortunately, cancer risks will remain extraordinarily high even after compliance with such a BACT standard. As many as 16 coke oven batteries may still pose risks exceeding one-in-10,000 for the most exposed persons. This high risk underscores the health protection need to replace coke ovens through the adoption of direct steelmaking on an accelerated schedule.

You also asked whether we expected foreign coke ovens to operate under the same environmental standards as in the U.S., and whether we would prefer U.S. coke demand to be met by uncontrolled facilities abroad. While we cannot project what environmental standards other countries will impose, based on the

²(...continued)

and is expressly intended to be a lowest common denominator standard; it is an emission rate based on "the 95 percent confidence limit for the worst performing battery with BAT technology." See p. 1-32. This level of control is forecast to achieve only a 37 percent reduction on overall coke oven emissions. When EPA proposed such a standard in 1986, it drew strong criticism not only from environmental organizations, but also from state and local air pollution control authorities who pointed out that more stringent emission limits had been achieved on some coke batteries through state and local regulations and consent decrees.

The next most stringent control alternative is called "LAER" and represents a higher level of reductions achieved in some consent decrees and state implementation plans.

A further option now under consideration is known as "LAER plus new doors." Leaks around ill-fitting and warped doors make up the largest fraction of emissions not controlled by the so-called "BAT" and "LAER" options. As stated in the Industrial Economics study (p. 1-34), "plus new doors" means "the installation of new doors on all ovens, along with the institution of a maintenance program at each battery to keep doors, jams and ovens in proper condition." The net reduction under this standard is 90 percent. There is virtually no chance that a weaker standard could meet the "BACT" test of H.R. 2585. Unfortunately, weaker standards might pass muster under H.R. 3030 and the Lent substitute, because they lack any meaningful "floor" for the technology-based standards.

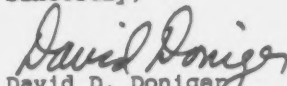
Hon. Terry L. Bruce
September 26, 1989
Page 7

foreign companies' investment trends reviewed above, it is unlikely that our European and Japanese competitors will be operating coke ovens at all much beyond the turn of the century.

The clear competitive imperative to replace coke-based steel production with direct steelmaking, both here and abroad, renders your final question quite moot. If the U.S. industry takes the steps it must to remain competitive, there will be no need for coke, either domestic or imported.

In sum, NRDC believes that even in the steel industry, the health protection standard of H.R. 2585 can be met within the time period allowed by the aggressive pursuit of direct steelmaking technology. With this technology, coke ovens and their cancer-causing emissions can be completely eliminated. Since coke ovens are generally agreed to be the hardest case among the industries that will be subject to air toxics legislation, NRDC has every confidence that the requirements of H.R. 2585 are not only needed to protect health, but also fully feasible.

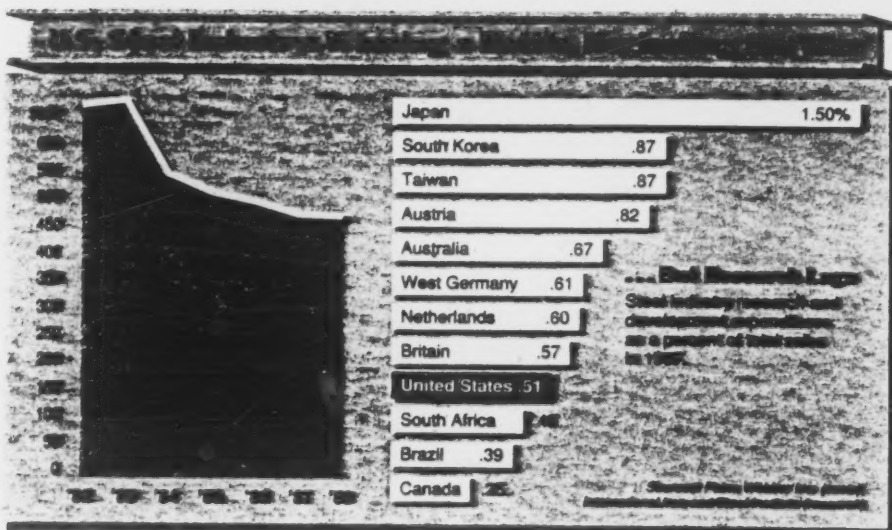
Sincerely,


David D. Doniger
Senior Attorney

enclosures (2)

Business Day

The New York Times August 7, 1989



The New York Times/Aug. 7, 1989

Steelmakers' Inferiority Syndrome

By JONATHAN P. HICKS

Special to The New York Times

EAST CHICAGO, Ind. — There is no denying that the last five years have seen great strides in the American steel industry, as companies close the competitive gap with many foreign rivals.

At the Inland Steel Company's streamlined and modernized Indiana Harbor Works here, for instance, making a ton of steel costs 24 percent less than it did in 1984. And at the USX Corporation's mill in nearby Gary, the labor needed to make a ton of steel has been reduced by more than 70 percent.

But industry experts warn that all the effort to catch up may go to waste unless American steelmakers find some way to increase their spending sharply on research and development. As things stand, according to a study by the University of Salford in Britain, the \$200 million that the Nippon Steel Corporation spends annually on research is more than the en-

tire American steel industry spends.

One specific worry is underinvestment in research in "direct steelmaking," in which coal and other minerals would be smelted into steel in a single step, doing away with the coke ovens and iron and steelmaking furnaces now needed to convert iron ore to liquid steel. The leading steel companies in the United States, along with the Energy Department, plan to spend nearly \$30 million in the next three years to develop the project.

By contrast, the Japanese steel industry has invested \$250 million in a similar project, and a consortium of European steel companies has already spent about \$100 million in the last three years working on such a process.

"The American steel industry is so far behind in research and development that it's doubtful it can ever catch up," said Jonathan M. Aylen, a senior professor of industrial economics at the University of Salford.



Mr. Boni

Robert E. Boni, chairman and chief executive of Armco.

Continued on Page D7

American Steel Industry Is Facing a Technological Inferiority Syndrome

Continued From First Business Page

"As a result, the typical American steel plant is likely to become an industrial museum."

Lower Maintenance Costs

Mr. Ayon predicted that the cost of maintaining machinery would increase as the steel industry's lower maintenance costs and energy consumption. "There are two areas in which the United States industry's research effort is deplorable," he said.

Of course, the American companies will be able to gain access to the new processes even if they play little or no role in developing them. They can either buy the machinery from foreign suppliers or turn into manufacturers through companies like North America

played a role in the domestic industry's latest renaissance and open signs of being replaced by different ones.

This year, for example, Armco Inc., the nation's No. 5 steelmaker, sold a 49 percent stake in its steelmaking division to Japan's Kawasaki Steel Corporation. Armco's chairman, Robert E. Bunt, said the deal would allow his company to compete in the Japanese market by taking advantage of the company's technological excellence in the fields that it traded in," he said.

Always a Step Behind

But those struggles alone the American companies to bring one step behind their rivals, creating a technological inferiority. And they also bring companies the upper hand in negotiating alliances.

"I worry about the state of things 10 years from now and beyond the year 2000 as it relates to the quality of the research and development," said Frank W. Lamm, chairman of the American Iron and Steel Institute, "I worry that product innovation will occur more readily in other countries."

The American steelmakers have all set out their playing catch-up in the past five years, thanks to the wrenching changes and the falling dollar, the average cost for a ton of American steel has fallen to \$400 from \$550, according to a study by

Costs are down, but spending on research is lagging.

Prime Wabash, Minneapolis, Japanese costs have risen from \$407 a ton in 1965 to \$550 last year.

The American companies have also gained on many European rivals, although some, notably British Steel, have also drastically improved operations. These changes, along with steel import quotas, cut the amount of foreign-made steel from 24 percent of domestic consumption in 1965 to 20.5 percent last year.

For From Secure

But the American steelmakers' gains are far from secure. A rise in the dollar could quickly wipe out their cost advantage, and the Bush Administration, in its recent decision to extend import quotas, has given the industry a warning that it is not immune from such protectionism.

The need to do better at research is all the more pressing because the American industry faces other hard times as well. The most damaging of all, steelmakers say, is the high cost of capital, which makes it harder to move quickly to take advantage of research gains.

"The cost of capital is one of the most serious factors we're least competitive," Mr. Lamm said. "Our cost might be 10 to 12 percent. But in Japan, steel companies borrow money at rates between 2 and 5 percent."

The high cost of capital makes it more important for a steel company to secure the best in technology, and to recoup its investment before the equipment is made obsolete by new advances.

"The American steel industry will have problems because the rate of change in the industry globally is increasing," said John Jacobson, an economist with the AISC Group, a Philadelphia economic forecasting firm. "The importance of staying on top is greater now than ever."

To be sure, there are some technological advances occurring in the United States based on home grown research. The Nucor Corp., for example, has started production in a plant in Crawfordsville, Ind., and is the first time steel sheet went from sheet to sheet in the United States. The first time the thickness of the sheet was 10 to 15 inches, the thickness, along with Nucor's use of scrap steel as a raw material, should cut the number of man hours needed to make a ton of steel to 13, Nucor said. That is about half the level of a highly efficient integrated mill like U.S. Gary works.

"This development has the chance of leapfrogging present technology," said F. Kenneth Iverson, chairman of Nucor, the largest of the "mini mills." It could mean the end of the steel industry's dependence on the United States and elsewhere.

While the industry is waiting closely to see how the Nucor tech leapfrogs, analysts and others say that begins, analysis and others say the Nucor mill will produce only 100,000 tons of flat-rolled steel a year, compared with four million in four million tons for a typical large mill.

And its usefulness is limited by the availability and price of scrap steel.

Over all, American steel companies now spend about five-tenths of 1 percent of their sales on research and development, according to the International Iron and Steel Institute. That compares with an average of seven-tenths of 1 percent for European steelmakers and 1.1 percent in Japan.

The highest research and development spending in the United States is in the steel industry, which was 20th on the list at \$20 million.

USX officials contend that American research and development spending is more efficient than that of foreign competitors. Foreign estimates of spending, they say, often include maintenance and support personnel, and are not directly involved in the research.

Figured Can Be Descriptive

Experts say such figures can be deceptive since research and development expenditures are not always easy to identify. Moreover, the Japanese steel companies are spending more than 50 percent of their research budgets on non-steel products like ceramics and computers for a variety of applications. From companies came to light-weight testing material.

"The Japanese companies look to the future and realize that in the long term an industrial nation cannot lead at steel as a growth industry," said Richard J. Fruehan, director of the Center for Iron and Steelmaking Research at Carnegie-Mellon University in Pittsburgh. "American companies do little if any work in alternative materials that could replace steel," he said.

few possible reasons would be stepped-up Federal involvement in steel research. Congress has directed steel research to be done by the government in many other countries, but because national governments have frequently owned all or part of the companies. But steel executives like Mr. Lamm prefer subsidies in the form of tax credits for company-sponsored research.

Mr. Fruehan noted that a lack of willingness to buy the new research in the United States is a major roadblock to scientists and engineers who can do the necessary work. "The big problem the steel industry will face in five years will be having enough good technical people to stay on," he said, adding that many of the steel researchers are now in the steel age. "The age group of 25 to 40 is hardly equal to a 25 to 40 group in the United States," he said.

**Impacts on Integrated Steel
Producers Resulting From
Regulation of Emissions From
Wet-Coal Charged By-Product
Coke Oven Batteries**

Prepared for:

Jim DeMocker

of

**Office of Policy Analysis and Review
Office of Air and Radiation
U.S. EPA**

Prepared by:

**Robert E. Unsworth, Timothy B. Petersen,
Michael T. Huguenin, Matthew J. Reilly**

of

**Industrial Economics, Incorporated
Cambridge, MA 02140**

August 1989

TESTIMONY OF

JOHN D. GRAHAM*

S.816 The Toxics Release Prevention
Act of 1989

September 21, 1989

Subcommittee on Environmental Protection
Committee on Environment and Public Works
U.S. Senate

Associate Professor of Policy and
Decision Sciences
Harvard School of Public Health
677 Huntington Avenue
Boston, Massachusetts 02115

THANK YOU VERY MUCH FOR THE OPPORTUNITY TO SPEAK TODAY. I WOULD LIKE TO BEGIN BY DESCRIBING THE NATURE OF THE AIR TOXICS PROBLEM IN THE UNITED STATES AND THEN CONCLUDE BY OFFERING SOME PRINCIPLES THAT I BELIEVE SHOULD GOVERN THE WRITING OF LEGISLATION IN THIS AREA. THE THEME OF MY REMARKS WILL BE BETTER USE OF RISK ASSESSMENT IN AIR TOXICS REGULATION.

THE PHRASE "AIR TOXICS" IS USED VERY LOOSELY TO REFER TO ALL AIR POLLUTANTS THAT MAY CAUSE SERIOUS HEALTH EFFECTS BUT FOR WHICH EPA HAS NOT ESTABLISHED A NATIONAL AMBIENT AIR QUALITY STANDARD. YOU ARE UNDOUBTEDLY AWARE THAT THERE ARE SEVERAL HUNDRED TOXIC AIR POLLUTANTS EMITTED BY VARIOUS INDUSTRIAL SOURCES. EPA HAS ESTIMATED THAT AT LEAST 2.7 BILLION POUNDS OF TOXICS ARE EMITTED INTO THE AIR EACH YEAR. LET'S BE SPECIFIC: WE ARE TALKING ABOUT POLLUTION FROM OIL REFINERIES, COKE PLANTS, PULP AND PAPER MILLS, DRY CLEANERS, BAKERIES, CHEMICAL FACTORIES, MOTOR VEHICLES, ELECTRIC POWERPLANTS, WOOD STOVES AND A VARIETY OF OTHER SOURCES. THE DIMENSIONS OF THE PROBLEM MAY SEEM FRIGHTENING, BUT IT IS IMPORTANT TO KEEP THE MAGNITUDE OF THE PROBLEM IN PERSPECTIVE.

FIRST, WHILE THERE IS A LOGICAL BASIS FOR PUBLIC HEALTH CONCERN, THERE IS NO DIRECT EVIDENCE THAT OUTDOOR EXPOSURES TO TOXIC AIR POLLUTANTS ARE RESPONSIBLE FOR A SIGNICANT FRACTION OF DISEASE OR MORTALITY. IT IS TRUE THAT DIRECT EVIDENCE OF PUBLIC HEALTH DAMAGE HAS BEEN DEMONSTRATED FOR CRITERIA POLLUTANTS SUCH AS OZONE, SULPHUR AEROSOLS, AND FINE PARTICULATES, AND THAT THE INDOOR AIR TOXICS PROBLEM MAY ALSO BE QUITE SERIOUS. IN THE CASE

OF OUTDOOR EXPOSURE TO TOXIC AIR POLLUTANTS, HOWEVER, HEALTH CONCERNS ARE INFERRED FROM EITHER LONGTERM ANIMAL STUDIES OR EPIDEMIOLOGICAL STUDIES OF HIGHLY EXPOSED WORKERS. THE LEVELS OF TOXICS THAT PEOPLE BREATHE IN DAILY LIFE ARE TYPICALLY SEVERAL FACTORS OF TEN SMALLER THAN THE LEVELS THAT HAVE BEEN STUDIED BY SCIENTISTS. NONETHELESS, THE AVAILABLE STUDIES ARE A SOUND BASIS FOR PUBLIC HEALTH CONCERN.

SECOND, DESPITE THE LACK OF DIRECT EVIDENCE, EPA RISK ASSESSMENTS SUGGEST THAT INHALATION OF AIR TOXICS MAY INCREASE THE INCIDENCE OF DISEASE, ESPECIALLY CANCER AMONG HIGHLY EXPOSED POPULATIONS. BASED ON A STUDY OF 65 TOXIC AIR POLLUTANTS, EPA ESTIMATES THAT UP TO 3,000 ADDITIONAL CANCERS MAY OCCUR EACH YEAR IN THE UNITED STATES. BY WAY OF COMPARISON, KEEP IN MIND THAT 900,000 NEW CASES OF CANCER ARE DETECTED IN THE UNITED STATES EACH YEAR.

IN A RECENT REPORT TO THE CONGRESSIONAL RESEARCH SERVICE, MY RESEARCH TEAM EXAMINED THE SCIENTIFIC BASIS OF EPA'S RISK ASSESSMENT PROCESS. WE FOUND THAT ALTHOUGH EPA HAS DEVELOPED A CANCER RISK ASSESSMENT PROCEDURE, THE AGENCY HAS NOT YET DEVELOPED A PARALLEL PROCEDURE FOR OTHER HEALTH EFFECTS SUCH AS NEUROTOXICITY AND REPRODUCTIVE EFFECTS. EPA'S WIDELY QUOTED CANCER RISK ESTIMATES SHOULD BE TREATED WITH CAUTION BECAUSE THEY ARE BASED ON SOME QUESTIONABLE ASSUMPTIONS -- FOR EXAMPLE, THAT HUMANS ARE AS SENSITIVE AS THE MOST SENSITIVE TESTED ANIMAL SPECIES, AND THAT ANY HUMAN EXPOSURE TO A CARCINOGEN, NO MATTER HOW SMALL, RESULTS IN SOME INCREASE IN CANCER RISK. WHILE THESE ARE PRUDENT ASSUMPTIONS

TO MAKE IN THE ABSENCE OF SOUND DATA, EPA HAS NOT ALWAYS BEEN RESPONSIVE ABOUT REVISING ITS ASSUMPTIONS IN LIGHT OF SCIENTIFIC ADVANCES. FOR EXAMPLE, EPA'S RISK ESTIMATES FOR BENZENE, FORMALDEHYDE, GASOLINE VAPOR, AND PERCHLOROETHYLENE ARE SCIENTIFICALLY OUTDATED AND NEED TO BE REVISED.

LET ME STRESS THAT REVISION OF RISK ESTIMATES BASED ON SCIENCE CAN RESULT IN EITHER MORE OR LESS PUBLIC HEALTH CONCERN. IN RECENT RESEARCH PERFORMED AT RESOURCES FOR THE FUTURE, DR. ADAM FINKEL HAS SHOWN THAT REVISION OF RISK ESTIMATES BASED ON SCIENCE CAN EITHER REDUCE OR INCREASE ESTIMATED RISK, DEPENDING UPON THE SPECIFIC POLLUTANT AND EXPOSURE SCENARIO. ALTHOUGH MANY INTEREST GROUPS IN THIS TOWN WOULD LIKE TO SEE LARGER OR SMALLER RISK ESTIMATES FOR THEIR OWN REASONS, THE PURPOSE OF INCORPORATING SCIENCE INTO RISK ASSESSMENT IS TO PROVIDE A MORE ACCURATE BASIS FOR PUBLIC POLICY DECISIONS. AFTER READING OUR REPORT TO CRS, EPA ADMINISTRATOR WILLIAM REILLY WROTE THE CONGRESS ON AUGUST 10TH AND PROMISED THAT THE AGENCY WOULD IMPROVE THE RISK ASSESSMENT PROCESS.

THIRD, PEOPLE WHO LIVE VERY CLOSE TO INDUSTRIAL SOURCES OF TOXIC AIR POLLUTANTS (E.G., COKE OVENS) MAY EXPERIENCE SUBSTANTIAL ELEVATIONS IN LIFETIME CANCER RISK, SAY, IN THE RANGE OF 1 IN 100 TO 1 IN 1,000. WHILE THE NUMBERS OF PEOPLE SEVERELY AFFECTED MAY BE RELATIVELY SMALL, THESE LOCALIZED "HOT SPOTS" OF RISK PRESENT A SERIOUS EQUITY ISSUE THAT CONGRESS SHOULD ADDRESS. WHILE I AM CONVINCED THAT SUCH HOT SPOTS ARE A POTENTIALLY SERIOUS PROBLEM, WE SHOULD KEEP IN MIND THAT THE EPA'S RISK ESTIMATES TO THE "MAXIMALLY EXPOSED INDIVIDUAL" OR "MEI" ARE HYPOTHETICAL. THEY

ASSUME, FOR INSTANCE, THAT PEOPLE LIVE OUTDOORS AT THE FENCELINE OF A MAJOR SOURCE FOR 70 YEARS, 24 HOURS PER DAY. MORE OFTEN THAN NOT, THE RISK ESTIMATES TO THE MEI ARE BASED ON PREDICTED OR MODELED EXPOSURES RATHER THAN ACTUAL PERSONAL EXPOSURES OR STATION MONITOR READINGS. EPA RISK ASSESSORS ARE AWARE THAT THEY NEED TO DEVELOP A MORE REALISTIC PROCEDURE FOR CALCULATING RISKS TO THE MAXIMALLY EXPOSED INDIVIDUAL.

HAVING SUMMARIZED THE NATURE AND MAGNITUDE OF THE AIR TOXICS PROBLEM, LET ME BRIEFLY OFFER THREE GUIDELINES FOR LEGISLATION.

FIRST, CONGRESS SHOULD REPLACE THE "AMPLE MARGIN OF SAFETY LANGUAGE" IN SECTION 112 WITH TECHNOLOGY-BASED STANDARDS FOR THE FIRST PHASE OF POLLUTION REDUCTION. WE ALSO NEED DEADLINES AND SO-CALLED "HAMMERS" TO ACCOMPANY THE TECHNOLOGY-BASED STANDARDS.

SECOND, CONGRESS SHOULD DIRECT EPA TO USE THE BEST AVAILABLE SCIENCE WHEN ASSESSING THE RISKS OF AIR TOXICS, ESPECIALLY IN THE SECOND PHASE OF THE PROCESS, IN WHICH RESIDUAL POLLUTION IS REGULATED. IN PARTICULAR, CONGRESS SHOULD ORDER EPA TO REVIEW ITS RISK ASSESSMENT GUIDELINES WITHIN TWO YEARS AND REVISE ITS RISK ESTIMATES FOR SELECTED POLLUTANTS IN LIGHT OF NEW SCIENTIFIC KNOWLEDGE. THERE ARE ALREADY SOME PROVISIONS FOR RISK ASSESSMENT IN S. 816, BUT THEY NEED TO BE REFINED AND MADE MORE SPECIFIC. WE ALSO NEED DEADLINES AND HAMMERS TO BETTER ASSURE THE USE OF SCIENCE IN EPA RISK ASSESSMENTS. TOUGH LANGUAGE WOULD STRENGTHEN THE HANDS OF THOSE EPA OFFICIALS WHO WANT TO UPGRADE THE AGENCY'S REPUTATION FOR SCIENTIFIC CREDIBILITY IN REGULATORY DECISION MAKING.

FINALLY, CONGRESS SHOULD RESIST THE TEMPTATION TO ESTABLISH

ARBITRARY RISK CUTOFFS SUCH AS ONE IN TEN THOUSAND OR ONE IN A MILLION FOR THE REGULATION OF RESIDUAL RISKS. WHILE QUANTITATIVE RISK ASSESSMENT HAS IMPROVED IN THE PAST DECADE, IT IS STILL AN INEXACT SCIENCE. IT WOULD BE FOOLISH TO PRETEND THAT SCIENTISTS KNOW WHETHER THE CANCER RISK POSED BY A PARTICULAR SOURCE EXCEEDS OR FALLS SHORT OF SOME PRECISE RISK NUMBER. INDEED, CONGRESS SHOULD INSTRUCT EPA TO INFORM THE PUBLIC OF THE UNCERTAINTIES IN RISK ASSESSMENT AS THEY ARISE ON A CASE-BY-CASE BASIS. RATHER THAN INSIST ON COMPLIANCE WITH INFLEXIBLE RISK CUTOFFS, CONGRESS SHOULD INSTRUCT EPA TO STRIVE FOR A BALANCE OF HEALTH, ECONOMIC AND TECHNOLOGICAL CONSIDERATIONS -- IN OTHER WORDS, APPLY AN UNREASONABLE RISK TEST.

IF THE PURPOSE OF THE SO-CALLED BRIGHT LINES IS TO PUT PRESSURE ON INDUSTRY TO REDUCE RESIDUAL EMISSIONS, I RECOMMEND AN ALTERNATIVE STRATEGY FOR ACHIEVING THAT GOAL. CONGRESS SHOULD COMPEL EPA TO PUBLISH EACH YEAR A LIST OF SPECIFIC PLANTS AND COMPANIES THAT POSE SIGNIFICANT RESIDUAL RISKS -- EITHER TO MAXIMALLY EXPOSED INDIVIDUALS OR TO THE GENERAL POPULATION. IN LIGHT OF THE PUBLIC'S GROWING INTEREST IN ENVIRONMENTAL QUALITY, I AM CONFIDENT THAT THE EMBARRASSMENT FACTOR WILL DO AN EFFECTIVE JOB OF CREATING INCENTIVES FOR CLEANUP OF RESIDUAL EMISSIONS. THE EFFECTIVENESS OF THIS STRATEGY WILL BE ENHANCED WHEN EPA'S RISK ASSESSMENT PROCESS EARNS A GREATER DEGREE OF CREDIBILITY WITHIN THE SCIENTIFIC COMMUNITY.

THANK YOU VERY MUCH FOR YOUR TIME AND I WOULD BE HAPPY TO ANSWER ANY QUESTIONS THAT YOU MIGHT HAVE.

TESTIMONY

OF

WALTER F. WILLIAMS

CHAIRMAN, BETHLEHEM STEEL CORP.

REPRESENTING

AMERICAN IRON AND STEEL INSTITUTE

BEFORE

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

ON

S. 816 AND S. 1490

AIR TOXICS CONTROL LEGISLATION

AND OTHER CLEAN AIR ACT AMENDMENTS

SEPTEMBER 21, 1989

Mr. Chairman and Members of the Committee, I am Walter F. Williams, Chairman of the Bethlehem Steel Corporation, testifying on behalf of the American Iron and Steel Institute (AISI). AISI is the principal trade association of the iron and steel industry, and AISI member companies account for about 80 percent of the nation's steel production capacity. I am accompanied today by Dr. David M. Anderson, General Manager, Environmental Affairs, Bethlehem Steel Corporation.

The U.S. steel industry is committed to the implementation of the Clean Air Act, and in fact has spent billions of dollars for air pollution control. AISI recognizes the need for amendments to the Clean Air Act, to improve its ability to provide adequate air quality to protect health and welfare while preserving the competitiveness of American industry and the economic viability of American communities. In particular, the steel industry believes it is necessary to amend section 112 of the Clean Air Act, the provisions for controlling toxic air pollutants which are the subject of today's hearing. While other aspects of the pending Clean Air Act legislation are important to the steel industry, today's testimony will focus on air toxics. AISI will submit written comments on proposals for acid rain control and nonattainment

at an early date.

AISI supports the Clean Air Act Amendments proposed by President Bush as an appropriate markup vehicle for Congressional action on clean air legislation in this Congress. The Administration bill has been introduced as S. 1490 in the Senate by Senator Chafee and others.

The steel industry appreciates the leadership shown by President Bush in the balanced general approach taken in the provisions of the Administration bill for the control of air toxics. The steel industry is committed to the control of toxic air pollutants through the application of the "maximum achievable control technology" (MACT), as required by the Administration bill. If a further control step is desired, dealing with any residual risk associated with sources of toxic air pollutants, AISI supports the approach of S. 1490, requiring the elimination of any unreasonable risk, taking into account the costs and availability of technology.

AISI also appreciates the willingness of Senator Durenberger and the other sponsors of S. 816 to change the fundamental approach of air toxics control into technology-based standards, and wish to thank Senator Chafee, Senator Durenberger, and the many others who cosponsored the Administration bill.

Impact on the steel industry of air toxics provisions

Section 112 of the Clean Air Act, requiring the establishment of emission standards for hazardous air pollutants, is generally considered to have proven unworkable. This provision takes a chemical-by-chemical approach to regulation, and the Environmental Protection Agency (EPA) has been able to promulgate emission standards for only seven air pollutants since 1970. Under current law, standards must be set so as to protect the public health with an ample margin of safety. Because EPA has taken the position that carcinogens do not have a "threshold" below which no health effects can be expected, it has been difficult for EPA to set standards.

In the Vinyl Chloride case, the U.S. Court of Appeals ruled that EPA could not consider costs or technological feasibility in determining safe levels for emissions of hazardous air pollutants. While the Agency has proposed several standards based on its interpretation of the Vinyl Chloride decision, no one is fully comfortable with that interpretation, and the Administration and the industrial community support amending the statutory basis for standards under section 112.

EPA has recently promulgated emission standards under section 112 for benzene emissions from coke oven

byproduct recovery plants, among other sources of benzene. Among the standards proposed by EPA are those regulating coke oven emissions generally. Both benzene and coke oven emissions are considered by EPA to be carcinogens. It is unlikely that the rule-making on coke oven emissions will be completed until after section 112 is amended. The decision as to benzene emissions may illustrate how the regulatory approach proposed in the President's bill will be interpreted, as discussed below.

Coke is vital to the production of steel, with about 1,000 pounds of coke required to produce one ton of iron, the raw material for integrated steel production. There are currently 22 domestic facilities where coke oven batteries are in operation, producing about 30 million tons of coke per year. Coke-making is a high temperature batch process of destructive distillation, requiring materials to be put into and removed from coke ovens periodically. Large amounts of dust, fumes and volatile matter are evolved in the coking process, and the very nature of the process makes emission control inherently difficult.

The steel industry has worked for many years to reduce emissions at coke oven batteries. The U.S. steel industry has already invested more than \$4 billion for air pollution control facilities. Much of that expenditure has been for the control of coke oven batteries.

Charging operations and equipment, once the major source of emissions, have greatly improved and are almost fully controlled. Equipment and procedures for pushing the coke (removing it from the ovens) have been improved as well. Controls already in place have reduced emissions by over 90 percent. The major remaining source of emissions at coke oven batteries is door leaks during the coking process. Although much progress has been made in door design and maintenance procedures, we appear to be reaching the limits of what can be done to control emissions from these inherently dirty, multi-door coke oven batteries. Even with these improvements, a coke oven battery is still driving volatile organic compounds out of coal under positive pressure, and is almost certain to leak.

The greatest promise for long-term, major environmental improvement may be in the development of a continuous process for making steel that eliminates the need for coke. AISI, in cooperation with the Department of Energy, has undertaken a project to develop such a process, but its success is uncertain, and even if successful, the replacement of existing highly capital intensive steel-making facilities with such new technology would require tens of billions of dollars and several decades.

Each of the legislative proposals currently available calls for a two-phase regulation of toxic air pollutants with technology-based emission standards as the first phase. EPA would be required to identify industrial categories that emit toxic air pollutants, and to establish a schedule for promulgating emission standards for many or all of those categories.

While the details of the bills vary, because of the existing regulatory activity it is likely that coke ovens would be in the first group of facilities regulated. Emission standards would be promulgated within 2 years after enactment, on the basis of the Maximum Available Control Technology (MACT) for the first categories of sources. Compliance with MACT emission standards would be required immediately for new sources, and 3 years after promulgation for existing sources (or about 5 years after enactment, for coke ovens).

The exact legislative language for determining what constitutes MACT will be important to the steel industry, particularly in the establishment of subcategories and the distinction between what is required of newer and older coke oven batteries. Of greater concern, however, is the second phase of standard-setting under the various legislative proposals. All require EPA to consider what risk to human health remains after the technology-based standards are

implemented, and to impose additional controls if there is a substantial residual risk to health. The bills differ as to their approach and stringency, however.

H.R. 2585, introduced by Rep. Leland and Chairman Waxman and others, requires second phase emission standards that lower the excess risk of contracting cancer to a maximum individual risk of less than one in a million (a 10^{-6} risk level). The compliance deadline is 10 years after enactment, with the possibility of extension for 6 more years if the facility can meet a standard lowering the risk of cancer to less than one in ten thousand (10^{-4}).

S. 816 requires EPA to set two simultaneous emission standards in the second phase for source categories with a significant residual risk. An emission standard reducing the maximum individual risk to 10^{-6} applies immediately to new sources, but may be extended indefinitely for existing sources that apply all available control technology and risk reduction methods. A 10^{-4} standard must be met by 10 years after enactment, with the possibility of extension for 5 years in cases of "extraordinary economic hardship". We understand that the authors of both S. 816 and H.R. 2585 view 10^{-4} as a "shutdown" standard: that is, they intend that if a source cannot meet 10^{-4} at some fairly early time, the source ought to be shut down. In practice, under H.R. 2585 10^{-6} would also

operate as a shutdown standard, at 16 years after enactment.

The President's proposal requires EPA to set a second phase standard to eliminate any unreasonable risk that remains after MACT is achieved. Under the Administration bill, these standards would take into consideration costs and technical feasibility, as well as health-based risk. This is the only proposal to allow the consideration of costs in the second phase standard-setting process. The Congressional bills specifically prohibit such considerations.

The effect on the steel industry of a risk-based emission standard can be quite significant. One control option identified by EPA in its 1987 rulemaking for coke oven emissions would require the installation of Lowest Achievable Emission Rate (LAER) technologies. Only 14 of the existing 134 coke oven batteries could achieve that standard without complete or partial rebuilding. EPA estimates the cost of compliance through rebuilding for the industry at \$360 million to \$5 billion. Further, EPA predicts that many plants would close, risking severe economic and social dislocation. What is more significant, however, is EPA's assessment that compliance with this LAER-based maximum use of available technology would achieve a reduction in maximum individual risk only to 3.0×10^{-3} . That is, an enormously costly standard that would result in widespread closure of coke oven batteries and plants, would

still not be able to attain the 10^{-4} risk-based standard mandated by several of these bills.

Even if many coke oven batteries were rebuilt to comply with stringent technology-based standards, or to meet a 10^{-4} risk-based standard, that would not constitute permanent attainment of that level of protection. Emission performance at coke ovens deteriorates with age, so that additional, frequent and expensive rebuilding would be required to keep them in compliance.

The EPA analysis accompanying the 1988 proposed benzene emission standards applicable to coke by-product recovery plants also shows the likely consequences of emission standards based on arbitrary maximum individual risk levels. That proposal identifies four approaches, including an emission standard achieving a maximum individual risk of 10^{-4} and one achieving a 10^{-6} maximum individual risk level of protection. While AISI does not agree with EPA's risk estimates, according to the EPA analysis, the 10^{-4} standard for coke oven emissions would shut down 36 to 39 of the 40 coke oven plants considered, with no feasible control technology. The 10^{-6} standard, according to EPA's estimates, closes them all.

The consequences of closing all or a large fraction of domestic coke ovens would be severe. The integrated steel

industry, the predominant supplier of steel in the United States, is dependent on the availability of coke. Imported coke is unlikely to be able to meet this demand. There is basically no merchant coking industry in the world today to produce blast furnace coke. Cokemaking is carried out within the steel industry itself. To the extent imported coke were available, this would make the steel industry a hostage to foreign sources of coke (primarily other steel producers):

Until U.S. steel producers or other interests were able to invest in and develop coking facilities outside of the United States, as well as the needed transportation systems and other infrastructure to assure timely delivery, the domestic steel industry would become noncompetitive for integrated steelmaking, with foreign steelmakers controlling the supply and the price of coke. Beyond the undesirable effects on our trade balance, this would also result in the exportation of our pollution. No other country has requirements for coke ovens as stringent as those in S. 816.

Operation and maintenance of air pollution control facilities already adds \$10 to 20 per ton to the cost of steel produced by AISI members. While AISI is committed to compliance with the requirements of the Clean Air Act, the Congress should consider the effects on competitiveness which control requirements can have.

Today's coke oven batteries are aging. Investment decisions will need to be made for cokemaking over the next few years. Clearly, compliance with the MACT standards will require such investment decisions. If an overly stringent risk-based emission standard applies to coke ovens, even if compliance were 10 or 15 years away, the steel industry is not likely to make the investments in rehabilitating or replacing coke ovens. Since there is uncertainty about whether even a new coke oven battery can meet a standard based on a maximum individual risk level of 10^{-6} , it would be difficult to replace existing coke oven capacity with new capacity.

The consequence of a 10^{-6} or 10^{-4} "shutdown" standard is likely to be a major cutback in the nation's steel production. At the least, the closure of coke ovens under H.R. 2585 or S. 816 would cost jobs in the steel industry, perhaps as many as 15,000, with jobs also lost in the metalurgical coal industry (perhaps as many as 10,000) and ancillary services.

These dislocations of steelmaking and coal mining communities could have a net negative impact on public health, including mortality rates, rather than achieving the small incremental reductions in potential cancer risk to which the risk-based standards are addressed. A report prepared by CONSAD Research Corporation in 1988 concluded that the risk-based standards being considered by EPA would "definitely

involve serious potential for adverse effects on physical and mental health" in the communities where unemployment impacts would be most severe. These effects, including stress-related health problems, alcoholism, spouse and child abuse, and other mental health consequences, could offset any marginal health gains in the community from decreased cancer risk.

Problems with Risk-based Standards Focusing on Maximum Individual Risk

The bills which would seek to reduce the level of remaining risk to 10^{-4} or 10^{-6} use a single factor--maximum lifetime risk to the theoretical most exposed individual--as the sole determinant of acceptable risk. This arbitrary, one-dimensional approach has in fact just been rejected by EPA in its recent final rulemaking on the benzene emission standards, first to interpret the Court's directions in the Vinyl Chloride case.

EPA pointed out that the use of a single risk factor such as maximum individual risk is too inflexible and limiting of the relevant information on risk which should be considered. Other factors pertinent to the health risk include the uncertainty of the information and the assessment methodology, the incidence of cancer in the exposed population (as opposed to individual risk), the weight of scientific

evidence for human health effects, and the effects of other facilities or other pollutants.

In addition, the risk assessment methodology used by EPA greatly overstates the air pollution-related cancer risk, because of the extremely conservative assumptions used. The air pollution-related cancer risks with which these bills are concerned are hypothetical and probabilistic in nature. They reflect statistical projections of risk that may not exist at all. Even if they do exist, they will be vastly exaggerated by EPA's risk assessment procedures. Both the cancer potency of the air pollutant under study, and the calculations of human exposure, are exaggerated.

In calculating cancer potency (i.e., the slope of the dose-response curve), EPA traditionally has used a linearized, non-threshold extrapolation model and has focused on the upper 95% confidence limit of that model. As EPA recognizes, other models (which may be as plausible or more plausible biologically and which may have a better statistical fit to the data) produce much lower estimates of risk. If the dose-response relationship at low ambient air concentrations is sublinear, a cancer potency factor calculated through the use of a linearized model would overstate the true risk by as much as several orders of magnitude. (Indeed, if the pollutant actually has a threshold for carcinogenic effects, there may be

no risk whatsoever at low ambient air concentrations.) EPA in fact acknowledges that its conservative methodology produces upperbound estimates of risk that may exaggerate by two or more orders of magnitude.

The Agency also uses highly unrealistic exposure assumptions to calculate risk for the hypothetical "most exposed individual". EPA assumes that some hypothetical person spends all of his time for 70 years outdoors at the location where the annual concentration attributable to emissions from a facility is predicted to be highest. No one resides for 70 years at the fenceline of a coke oven battery, never going indoors. Hardly any coke oven battery is likely to last 70 years. Each of the key assumptions is unrealistic. Cumulatively, they produce a grossly exaggerated estimate of exposure (and associated risk) for the "most exposed individual". Again, EPA recognizes this problem, referring to their estimates as "upperbound" estimates that may overstate the true risk by several orders of magnitude. This was one of the reasons cited by EPA for not relying on a single factor of estimated maximum individual risk in setting the benzene standards.

In fact, it is not clear that these statistical projections of risk relate to any risks that actually exist. Epidemiological studies of the communities surrounding coke

oven batteries, such as Allegheny County, Pennsylvania, fail to show any correlation between coke oven emissions and increased cancer rates. A study by CONSAD, Inc., "Community Health Effects Associated with Coke Oven Emissions", examined the health data in Allegheny County, the site of the nation's largest coke plant. That report concludes "Overall, the evidence reviewed in the four complementary substantive areas, considered together, indicate that there is no coherent scientific evidence of any adverse community health consequences associated with general population exposures to coke oven emissions."

People ordinarily do not accept or reject risks based on a single factor, such as health, in isolation. As EPA observes in the Preamble to the recent benzene emission standards, "the acceptability of a risk depends on consideration of a variety of factors and conditions." Under the Vinyl Chloride opinion and the current section 112, EPA may consider costs and feasibility of controls only in establishing an ample margin of safety, not in the determination of an acceptable level of risk. EPA makes the observation that the benefits of the activity and the feasibility of controls are among the factors that an individual would normally consider in determining whether a risk was acceptable.

This is the case with examples such as the use of

motor vehicles or business travel on airlines. While there is a certain voluntary character to an individual's participation in these risks, the risky nature of these activities is tolerated by society based on a balancing of the value of the activity and the lack of acceptable alternatives, among other factors.

This is the approach taken in S. 1490, allowing the weighing of costs, technical feasibility and the benefits associated with the source category in determining whether any residual risk was unreasonable. This is a better approximation of how people actually make personal decisions of acceptable risk, and it avoids the consequences of an arbitrary use of a single assessment of risk that is likely to overstate actual risks.

It is interesting to observe how EPA applies these concepts in the recent benzene emission standard rulemaking. Although the current law only allows health-related factors to be considered in determining the acceptability, or "safety", of an emission level, the reasoning and outcome appears to be consistent with the way the Agency would interpret the "unreasonable risk" standard in the Administration bill. The approach taken establishes a presumptive limit on maximum individual risk of 10^{-4} . This is not a rigid rule, however, but allows for the consideration of other health-related

information. The emission standard selected for coke oven by-product recovery plant benzene emissions, in fact, achieves a 2×10^{-4} level, which the Agency determines is acceptable because of uncertainties in the risk estimation. In the second phase consideration of margin of safety, in which costs and technical feasibility may be taken into account, EPA is requiring no additional margin of safety because the emission reduction benefits are not commensurate with the additional costs.

What the Steel Industry Supports

A control program for air toxics, and particularly for coke oven emissions, which is based on the best available control technology would adequately protect public health. The steel industry supports a technology-based approach (MACT) for further control of coke oven emissions. AISI understands, however, that a two-phase control program appears almost inevitable as part of the final Clean Air Act legislation.

The Bush proposal requiring additional control only to the extent necessary to eliminate "unreasonable risk", and allowing consideration of costs and technical feasibility, appears to be the most preferable alternative for the steel industry. Not only is it more likely to avoid the disastrous economic consequences for the steel industry described above,

it makes use of risk assessment methodologies in a more realistic way than the imposition of arbitrary residual risk-based standards.

The steel industry supports title III of S. 1490, and in particular urges retention of the unreasonable risk standard for dealing with any residual risk after MACT emission standards are implemented. This approach will allow the balancing of the benefits of cokemaking and integrated steelmaking, the potential competitive effects of regulation, the total social costs of regulation, other health factors such as the total exposure and incidence of cancer and the weight of the evidence of carcinogenicity, compliance costs and the availability of technology, as well as the maximum individual risk.

The 1987 EPA-proposed emission standards for coke oven emissions predate the Vinyl Chloride decision and are technology-based standards. They may be the equivalent of MACT. It is important to the steel industry, however, to obtain the most reasonable definition of available technology, to avoid a standard which may be unreasonably technology-forcing. It would be desirable to have subcategories for coke oven emissions drawn so that technologies used in newer batteries are not set as the standard for older batteries, or for batteries with different

configurations, for which these technologies are not fully appropriate. While a 90% reduction from uncontrolled emissions is a useful benchmark, as proposed in S. 816, it is not always wise to set an emission standard based on the emission performance of the best performer in an industrial category, without considering other factors.

S. 1490 does not explicitly require EPA to distinguish between old and new batteries, although S. 816 does. MACT standards are set on the basis of what is, or can be, achieved in "similar sources". This grants considerable discretion to EPA to determine what sources are similar. The Administration bill even gives EPA the power to set MACT standards for sources "without regard to the performance of similar sources". It is unlikely this would apply to coke oven emissions, since there are no cognate sources in other industrial categories, but this open-ended definition of MACT could prove troublesome.

A similar problem may arise with the definition of "new source" in S. 1490. In current section 112, a source is new if it is constructed or modified after the proposal of applicable standards. The pending legislation would apply new source standards to those sources constructed or reconstructed after proposal. The threshold for "modification" is a significant increase in emissions. A reconstruction need not

involve any increase in emissions, however. Since the rebuilding of a coke oven battery is a common maintenance practice, this change in language could result in the imposition of more stringent emission standards appropriate for new sources, on coke ovens that are merely being rebuilt. This could be even more of a problem if this definitional change were combined with the provisions of S. 816 that impose 10^{-6} limits on new sources before they can begin operation.

Although the steel industry prefers and supports the unreasonable risk approach of S. 1490, if the structure of S. 816 were used it would be important to clarify what constitutes an "extraordinary economic hardship" qualifying for a 5-year extension of the residual risk standard. Surely the distress faced by the steel industry over the potential shutdown of more than 90 percent of the coke ovens in the country ought to qualify.

S. 816 simply does not provide enough time to develop compliance technologies for coke oven emissions for standards beyond MACT. A major effort will be needed for the research and development of emission control and process technologies, to produce the dramatic breakthrough that will be necessary in an attempt to achieve the residual risk levels described in S. 816. The steel industry will need to commit resources to the effort to research and develop process

technologies such as direct steelmaking and emission controls toward the goal of attaining a realistic, reasonable maximum individual risk level, but will need more time than provided by S. 816 to bring it to fruition.

In addition to research on compliance technologies, more research is needed to develop a realistic risk assessment methodology. The risk assessment study required by S. 816 is a good idea, and deserves a greater level of effort. This study should be performed by an independent body such as the National Academy of Sciences, and needs to be completed, and its recommendations incorporated into the guidelines for performing risk assessments, before the decisions on residual risk leading to emission standards beyond MACT are made.

In summary, Mr. Chairman:

- AISI supports S. 1490.
- The steel industry supports controls on toxic air pollutants, including coke oven emissions, based on the maximum available control technology (MACT).
- AISI supports the unreasonable risk standard of S. 1490 as a means of addressing any residual risk after implementing MACT standards.

- o The steel industry will need to commit resources to research and develop process technologies such as direct steelmaking and emission controls toward the goal of attaining a realistic, reasonable maximum individual risk level, if more time to complete that research is provided.

- o There is also a pressing need to improve risk assessment methodologies, and to incorporate those changes into the guidelines for performing risk assessments, before making the decisions on residual risk-based emission standards.

Thank you for the opportunity to testify on this important issue of air toxics control. We will be happy to answer questions.

#

WRITTEN STATEMENT OF
WILLIAM F. O'KEEFE
VICE PRESIDENT AND CHIEF OPERATING OFFICER
OF THE
AMERICAN PETROLEUM INSTITUTE
BEFORE THE
UNITED STATES SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
ON
S-816 AND S-1490
PROPOSED AMENDMENTS TO THE CLEAN AIR ACT
ON NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS

WASHINGTON, D.C.

SEPTEMBER 21, 1989

I. INTRODUCTION

Good morning Mr. Chairman. My name is William O'Keefe, Vice President and Chief Operating Officer of the American Petroleum Institute (API). API is a national trade association representing over 200 companies in the petroleum refining, production and exploration, transportation and marketing sectors. I am pleased to have this opportunity to address proposed amendments to the Clean Air Act (CAA) on hazardous air pollutants. I will present API's views on reducing emissions of toxic air pollutants and will comment specifically on S-816 and S-1490.

API shares the goal of the Congress, the Administration, and the American people to reduce concentrations of hazardous air pollutants. API plans to continue its active participation in the debate over legislation that fulfills this goal, keeping in mind other goals that the American people desire - such as the expansion of economic growth and opportunity. We believe that the legislation proposed thus far must be refined in order to achieve all of these goals simultaneously. Improvement can be made by adopting provisions in the legislation for reasonable technology based controls for those sources found to be

significant emitters of toxic air pollutants, and by targeting residual risk control requirements for any remaining facilities that pose an unreasonable risk after implementation of technology-based control requirements.

Successful implementation of a hazardous air pollutant control program will depend, in part, on focusing the program towards control of the sources of greatest concern first. To insure that controls are first implemented on the sources of greatest concern, the criteria used to select and rank source categories for regulation should include substance toxicity, population exposure, quantity of emissions, geographic location of facilities, and current degree of emissions controls. These criteria should focus on protecting public health, and not attempt to address environmental effects. Public health is the primary concern over air toxics, and should remain as the central focus of air toxics legislation. Furthermore, we believe that control requirements to protect public health will also protect the environment, while avoiding difficult and uncertain attempts to assess impacts on the environment.

Before commenting on S-816 and S-1490, I would like to discuss the magnitude of the air toxics problem in the United States, and

the principles API believes should apply in developing legislation to reduce the problem.

II. THE MAGNITUDE OF THE AIR TOXICS PROBLEM

Recent data collected under SARA Section 313 indicate that large volumes of chemicals are released to the atmosphere from manufacturing facilities nationwide. While this information raises legitimate concern about toxic releases, the data do not indicate the degree of exposure that these emissions contribute to overall population or environmental risks. For example, benzene is listed in the toxic air pollutant inventory as one of the top 25 chemicals released. Total Exposure Assessment Methodology (TEAM) data from EPA indicate that industry emissions account for only about 14 percent of the total releases of benzene to the atmosphere. The TEAM data further emphasize that industry emissions account for only about three percent of total human exposures to atmospheric benzene. The EPA TEAM data therefore underscore the conclusion that emission data do not provide a direct measure of human exposure.

It should also be recognized that controls established under existing law have led to significant progress in reducing toxic

emissions. The current National Ambient Air Quality Standards (NAAQS) controls also reduce toxic air emissions. For example, measures to reduce volatile organic compounds (VOC's) for control of ozone already control many of the VOC's addressed in the proposed legislation for air toxics. Particulates are controlled in the NAAQS program with technologies that reduce emissions of hazardous metal compounds.

We believe that while air toxics is an issue that requires continuing effort, toxic air emissions do not pose a nationwide public health crisis. For example, EPA has estimated that the risk of cancer from lifetime ambient exposure to hazardous air pollutants ranges from 5 to 7.4 cases per million people annually.¹ To put this in perspective, the annual risk of electrocution in the U.S. is of a similar magnitude (5.3 per million people per year).² Reasonable progress should be the goal of air toxics legislation, not draconian measures that could

¹ EPA Office of Air and Radiation, "The Magnitude of the Air Toxics Problem in the United States," 1985. Annual risk based on estimated cancer incidence from four separate analysis for 15 to 45 different compounds.

² Richard Wilson and E.C. Crouch, Harvard University, "Risk Assessment Comparisons: An Introduction," Science Vol. 236, pp. 267 - 295, April 17, 1987.

severely impact our economy and standard of living.

III. PRINCIPLES AND SPECIFIC COMMENTS ON PROPOSED LEGISLATION

API believes that two overriding principles should govern the development of air toxics legislation. First, legislation should integrate technology-based requirements with risk determinations, and then focus initial regulatory requirements on those source categories that pose the most significant health risks. This initial regulatory approach should be followed by a second step to assess any residual risk and determine whether additional controls are needed. Second, API recommends that the legislation provide a mechanism to assess the magnitude and sources of actual area exposures to toxic air pollutants, especially in urban areas, so that the most cost effective control decisions can be made to reduce exposures.

Our specific comments on S-816 and S-1490 address seven important issues that are vital to developing amendments.

- (1) A technology based approach in the amendments can be made workable if realistic control requirements are mandated and if at least 10 years of usable life is provided for

pollution control equipment. Technology based control requirements should be based on commercially available equipment demonstrated in the source category of concern with consideration of the marginal cost of alternatives compared to the incremental benefit in terms of reduced emissions. The Maximum Achievable Control Technology (MACT) benchmark for each source category should be based on a representative sample of controls used at the best performing facilities, and not necessarily the controls used at the single best performing facility. Consideration should be given to emission control equipment already in place to control volatile organic compounds in ozone nonattainment areas.

- (2) Provision should also be made for a source category ranking system that (a) leads to priority regulation of the most significant sources first, and (b) allows for control technology to be specified at the process unit level based on performance standards. We believe that both S-816 and S-1490 provide a workable framework for source category ranking and standard setting, and find the three year compliance schedule in both bills to be adequate for implementing the technology requirements. However, the

initial provision in S-816 for regulation of all sources that emit any of 12 listed chemicals is less rational and effective than the schedule offered in S-1490 that regulates the most important source categories of emissions first.

- (3) Air toxics legislation should also provide for exclusion of sources from technology control requirements that either (a) pose an insignificant (i.e. negligible) risk to public health (such as those located in remote locations), or (b) represent extremely low (i.e. de minimis) emission levels. Based on these two criteria, the vast majority of oil and gas production facilities in the country should be exempted from technology based controls except where an unreasonable risk to health from individual sources is demonstrated.
- (4) Area sources should be addressed separately in the legislation, with studies undertaken and controls mandated only upon demonstration of unreasonable risk. Area source exposure studies should be initiated in urban areas around the country to assess the magnitude and sources of exposure. In this way, the most appropriate solutions to reduce

exposures can be achieved. Mobile source controls should be addressed under Title II of the Clean Air Act, as in S-1490, not additionally in the air toxics sections of the legislation as proposed in S-816. The contribution of indoor sources of exposure should be factored into the evaluation of the benefits of controlling outdoor sources.

- (5) Air toxics legislation should avoid specifying numerical residual risk limits, and allow EPA to determine unreasonable risk levels for each source category regulated. This is necessary because risk decisions are complex, involving careful judgements on issues such as: (a) the quality of risk data, (b) the degree of toxicity and exposure for all chemicals released, (c) important measures of risk, including population incidence, that could have bearing on the assessment, and (d) special considerations such the cost and economic impacts of additional controls and the life expectancy of the plants operating. The residual risk test should be based on "most plausible" estimates of exposure and potency. S-1490 is preferable in this regard since "unreasonable risk" goals are specified, with consideration of cost factors. The "one-in-a-million" risk goal and "one-in-ten-thousand" risk maximum, without

consideration of broad social and economic "costs", as specified in S-816 would lead to extremely narrow decisions for air toxics regulation with consequences that could be far more adverse than the hypothetical benefits gained.

- (6) Legislation should avoid a burdensome permitting process. Only re-permitting for those modifications that are substantial and that lead to net increases in air toxics emissions should be required. We recommend provisions for reasonable permitting requirements that, to the extent possible, use existing permit systems, avoid unnecessary delays and minimize impediments to pollution control implementation. We believe that this can best be achieved by a legislative provision for general permits or permits by rule. In this regard, neither S-1490 nor S-816 are preferable in the permit requirements specified. Both bills need to be modified to incorporate the provisions of permit by rule, or general permits.
- (7) Catastrophic releases should not be separately addressed in air toxics legislation, but rather addressed in SARA Title III and through process hazard management provisions in OSHA. The provisions proposed in S-1490 under Title VII are

preferable in this regard. API endorses the establishment of a Chemical Investigation Board to assess major life threatening releases of air pollutants.

In short, API believes that current legislative proposals in S-816 and S-1490 to amend Section 112 with a "technology based" approach can be made workable with the refinements noted above.

In addition, API is especially concerned that a reasonable residual risk test be implemented in the legislation, as specified in S-1490. The residual risk test as specified in S-816 has the potential to cause severe economic disruption with no real benefit to public health. Our strong concern over the residual risk provision in S-816 is based on: (1) the exclusive use of ultra-conservative risk assessment methodologies when other methods are scientifically sound or, in some cases, scientifically superior, and (2) the quasi-zero risk target of one-in-a-million to a hypothetical maximally exposed individual, without consideration of the full implications of these hypothetical and unrealistic risk assessments. The combined effect of ultra-conservative risk methodologies and a quasi-zero risk target, as specified in S-816, could result in unattainable emission limits for numerous facilities.

IV. SPECIFIC ISSUES OF CONCERN

This section of our testimony addresses specific issues with regard to air toxics legislative proposals in S-816 and S-1490. In addition, we offer a number of recommendations we believe would result in more workable and effective amendments.

A. Control Technology Requirements

API believes that the initial technology driven control requirements should be based on commercially available control equipment demonstrated in the source category or subcategory. This is necessary for a number of reasons:

Commercially demonstrated and available technology for each source category will likely achieve most of the emission reductions necessary to ensure protection of health and the environment. In most instances, technology requirements based on "most stringent achieved in practice by a source" or "more stringent where feasible" would not achieve significantly greater incremental health benefits than commercially available requirements, but would increase marginal costs significantly.

The benchmark for MACT should be a representative sample of the best performing top 20 percent of facilities in a source category. Furthermore, the performance of the "benchmark" facilities should be appraised in terms of the representative degree of controls typically achieved during normal operation of the facilities, and not in terms of either the worst or best potential performance.

It should be noted that, in the event non-commercially available technology is deemed necessary for a source category, the Administrator should have the authority to consider the impacts due to lack of equipment and engineering availability to meet regulatory requirements and the flexibility to consider modifications of emissions standards.

If unproven technology is required prematurely and fails to perform as designed to achieve emissions reductions, economic waste is guaranteed and public health is not protected. The significance of any potential health risks remaining after commercially available controls are installed would be evaluated subsequent to a residual risk determination.

Control technology requirements should be established with consideration of the marginal cost incurred for each increment in emission reduction. For example, if two technologies are commercially available to control a specific process, with technology 'A' providing 99 percent control at a cost of one million dollars, and technology 'B' providing 99.9 percent control for 5 million dollars, the incremental benefit of technology B is very small compared to the additional cost over technology A. In this hypothetical case, technology A would be preferred as the technology-based solution.

In the case where certain high exposure instances posing unreasonable health risks occur, the second phase residual risk determination would indicate that technology B is necessary and thereby provide a safety net to protect public health. In this way, the extreme costs of most stringent controls are reserved for those cases in which the extra emission reductions are needed to protect surrounding communities.

Neither S-816 nor S-1490 appears to adequately address the concept of marginal cost and incremental benefit of technology-based requirements for source categories. Although both S-1490 and S-816 do endorse a general concept of cost consideration in

developing technology requirements, we believe the legislation should be explicit in directing EPA to evaluate the marginal costs of a more stringent requirement compared to the incremental benefit received in terms of reduced emissions. As such, legislation should not require a priori that new or existing facilities employ the most stringent available technology unless the cost bears a reasonable relationship to the emission and risk reductions that would be achieved. Similarly, the legislation should not mandate technology that is feasible, but not yet available, unless it, too, provides reasonable emission reductions in relation to costs.

B. Source Categories for Regulation

The provisions included in both S-1490 and S-816 call for technology-based requirements to be established for a hierarchy of source categories. API believes that the general concept of a technology determination of control requirements in each source category, with the most significant source categories addressed first, is a workable approach if properly conceived in the legislation. Air toxics legislation should provide a mechanism for EPA to focus attention on reducing emissions in those source categories or subcategories identified as presenting significant

risks to public health.

However, S-816 requires regulating all source categories, regardless of whether their emissions have a public health impact. The provisions specified in S-1490 is more preferable. Instead, S-1490 provides that source categories that pose an inconsequential risk to public health may not require further regulation.

The following recommendations are made to further improve the source category provisions proposed in the S-1490 and S-816:

- (1) A multi-step rulemaking process should be specified in the legislation for selecting and ranking source categories and subcategories for technology based controls. Included in the process should be a provision for EPA to develop, by rule, criteria for defining, listing and ranking source categories and subcategories to be considered for regulation. The criteria should include substance toxicity, population exposure, quantity of emissions, geographic remoteness of emission sources, and the present degree of emission controls. If sources beyond SIC Codes 20 to 39 (manufacturing facilities that submit SARA Section 313 data)

are to be regulated, then legislation needs to define how data will be developed to estimate emissions of covered toxic pollutants.

- (2) Technology-based regulations should be founded on performance criteria at the unit or process level.
- (3) Subcategories of sources should be designated within source categories based on factors such as: size, remoteness of location, and differences in population exposure potential.
- (4) The schedule for emissions standards should be based solely on the ranking of the source categories and subcategories identified by EPA, as provided in S-1490. Provision in S-816 for emission standards to be established within two years for all categories or subcategories that emit any of 12 chemicals specified (plus coke oven emissions) cannot be administrated. This is because the 12 compounds listed include some substances commonly in use or present to some degree in many industrial operations. Thus, EPA could not comply with such a provision, even in the best of circumstances, and categories presenting little risk to public health may receive unmerited priority. S-1490 is

therefore preferred for its initial source category driven compliance schedule, and this provision should be adopted instead of the initial chemical driven compliance schedule contained in S-816.

- (5) Unlike other proposed legislation, both S-1490 and S-816 provide an ample three year period for facilities to comply with technology requirements. API recommends that the three year period be retained in the legislation.
- (6) Source categories and/or subcategories posing minimal population exposure potential due to remoteness of facilities or de minimis emission levels should be eligible for exemption from technology-based control requirements (i.e. delisted from the ranking scheme). Oil and gas exploration and production facilities should be exempt from controls except where EPA or state/local government demonstrate that a facility presents an unreasonable risk to the public.

API believes that regulation of all hazardous pollutant source categories currently contemplated by EPA, including, for example, minor sources such as remote oil production wells, dental

preparations and sawmill operations, would be a waste of resources and would not lead to improved public health protection.³

C. Exclusion of Inconsequential Sources

An important provision that should be included in any technology based air toxics legislation is the allowance for facilities to avoid costly control requirements when their emissions are inconsequential to public health. Two mechanisms to prevent unnecessary controls include an insignificant risk exclusion for individual facilities, and a reasonable de minimis emission rate for very small facilities.

Without provision in legislation for inconsequential sources to be exempted from expensive control requirements, as provided in S-1490, thousands of facilities would be required to install control technology at great cost with little to no likely public health benefit. The economic repercussions of such a requirement

³ EPA has received a preliminary air toxics ranking scheme for 360 source categories, including minor sources with low health risk potential such as oil and gas production, dental preparations, and sawmills among many others. The report is entitled "Source Category Ranking System" prepared by Radian Corp., EPA contract No. 68-02-4330; DCN No. 88-239-001-51-10, August 31, 1988.

could have societal impacts that overshadow any potential benefits of the entire air toxics program.

API believes that the insignificant risk determination should rest with either the facility or state and local governments since the number of assessments likely to be performed would overwhelm the capabilities of federal agencies. Federal guidelines should be followed in conducting the assessments, and Agency review, either independently or as part of the permit process, should be implemented. The guidelines EPA establishes for insignificant risk determinations should be developed through rulemaking, and should follow, as time allows, the recommendations noted below concerning risk assessment guidelines.

API believes that the de minimis emission waivers in S-816 are a step in the right direction, but could be improved. The de minimis waivers in S-816 would only apply to a major source that is unnecessarily regulated with technology-based requirements because its aggregate emissions of multiple chemicals are over 25 metric tons. As proposed, the source might qualify for an exemption if emission rates of specific chemicals are all below a 10^{-4} risk criteria. While laudable in concept, we believe that

EPA discretion should be allowed in defining the risk limit for de minimis emission rates, taking into account (a) the pollutants emitted, and (b) the quality of potency and exposure data available. In addition, we believe that a de minimis exclusion should be made available for area sources, as well as major sources, to avoid excessive regulation on very small emitters of toxic air pollutants. Both S-816 and S-1490 could be improved by including these de minimis emission rate provisions.

D. Area Sources

Legislation to amend Section 112 should make special provision for area sources to ease administrative needs. As proposed, both S-1490 and S-816 contain such provisions. However, area sources should not be required to meet stringent MACT requirements such as for major sources, as could occur in both S-1490 and S-816, unless it is determined that the incremental cost of more stringent control requirements is merited by the degree of emission reductions. API would prefer that the specification for cost-effective Generally Available Control Technology (GACT) be applied to all area source categories meriting control.

We would emphasize more strongly in both S-816 and in S-1490 that

the emphasis on area source controls should be in those areas of the country where hazardous pollutant concentrations merit area wide controls based on a demonstration of potential and unreasonable risk. In this regard, area sources should have a control program based on analysis of the area wide emissions in the localities of concern. The provision in S-816 for preparation by EPA of an area source strategy is laudable, but it should be completed before area source controls are mandated. In this way the most cost effective and needed requirements can be implemented without wasting resources.

API is additionally concerned with the inclusion of mobile sources in the area source program specified in S-816. While the area source study should include mobile sources in analyzing ambient contributions, API believes that fuel specifications and emission control technology requirements for mobile sources should be considered separately in Title II of the Clean Air Act, as proposed in S-1490, to avoid an exceedingly complex array of state and local requirements for vehicles and fuels that are manufactured on a national scale. In this regard, the benzene in fuels study proposed in S-816 should not be incorporated in air toxics legislation, but considered under Title II on mobile sources.

Provision is also included in S-816 for a hydrogen sulfide study. We believe the bill should state that pertinent sources, including numerous area sources, of hydrogen sulfide not be considered for regulation until the hydrogen sulfide study is completed.

E. Residual Risk Determination

Residual risk requirements could result in continued controversy and regulatory stalemate if provisions for risk assessment are not properly conceived in the legislation. API has several concerns and recommendations in this regard:

- o The legislation should avoid a residual risk determination that allows the imposition of additional control requirements before previously required equipment has served a useful life. API recommends that installation modifications resulting from residual risk determinations not occur before previously required technology-based controls have at least a ten year investment period. To this end, a residual risk determination should be specified in the legislation seven years after the implementation of

technology controls as specified in S-1490 (not three years as proposed in S-816). API believes that the six years provided in S-1490 for facilities to comply with residual risk requirements is satisfactory.

- o Additional controls to address residual risk should only be mandated to the extent feasible with consideration of cost factors. S-1490 is much preferable to S-816 in this regard.
- o The methodology specified to conduct a residual risk determination should be based on scientifically sound methodology employing "most plausible" estimates when data are available, not upper bound estimates of risk. This is consistent with EPA's current risk assessment guidelines and the views of the scientific community. Both S-816 and S-1490 should specify "most plausible" estimation methodologies for risk assessment.
- o A residual risk target should not be specified in the legislation. EPA discretion should be allowed to determine acceptable risk levels for each source category, with consideration of the quality and uncertainty of the potency information and exposure analysis available for the

chemicals emitted, and with consideration of all risk measures including population incidence and risk distribution estimates. The one-in-ten thousand risk requirement and one-in-a-million risk goals specified in S-816 are therefore much less preferable to the prevention of "unreasonable risk" specified in S-1490.

- o Risk models used should be periodically reviewed by an independent scientific panel, formed in a non-regulatory agency such as National Academy of Sciences, National Science Foundation, National Institutes of Health, and/or the Society for Risk Analysis. We applaud the provisions in S-816 to improve risk assessment guidelines.
- o The residual risk determination should employ site specific community location and exposure data. Calculations of risk should not be based on hypothetical worst case assumptions such as a maximally exposed individual (MEI) continuously located at a facility fenceline, 365 days per year for 70 years. Instead, more realistic exposure scenarios should be used such as: (a) exposure levels at the residential location with the maximally calculated exposure from the source; and (b) exposure duration calculations based on

population statistics of geographical mobility and daily activity patterns. Both S-1490 and S-816 can be improved by incorporating the use of site specific data and population statistics.

To further address the residual risk requirements of the proposed legislation, API believes that S-816 places extreme emphasis on unrealistic risk goals. API and the public have several reasons to be concerned with the rigid one-in-a-million risk targets specified in S-816 for the maximally exposed individual including:

- o Risk uncertainty - Keying regulatory decisions to a one-in-a-million risk target for the MEI without regard for the underlying uncertainty of that estimate renders the criterion meaningless. Risk assessments for low concentrations of pollutants (part per trillion exposure levels) to a hypothetical maximally exposed individual involve extended extrapolations of high dose toxicological data that are highly uncertain. Typically, a one-in-a-million risk determination for hazardous air pollutants has uncertainty bounds of two orders of magnitude or more. For example, benzene has been estimated to pose a

1 in 100,000 lifetime risk of cancer with exposures as low as 0.06 parts per billion (ppb) to 12 ppb or higher, a 200 fold difference in estimates. In addition, coupling risks from multiple pollutants, as proposed in some provisions of S-816, would further compound the uncertainty in estimating risk. We believe that flexibility is needed in the legislation for EPA to gauge the quality of the risk data used in setting regulatory requirements.

- o Other risk estimates - The proposals in S-816 ignore other risk estimates that are important in regulatory decision making. Included for consideration should be estimates of population incidence (cancer cases estimated in the entire population) and risk distribution (how much a regulatory decision reduces the risk in the entire population, not just for one hypothetical individual). Both population incidence and risk distribution estimates are more certain estimates of risk compared to estimates of maximum individual risk specified in S-816. API believes that a flexible approach in assessing risk information is needed to make the best regulatory decisions, utilizing information on all measures of risk and incorporating judgement on the quality of data available to make risk determinations.

- o Unknown impact - The number of plant shutdowns and economically crippled industrial operations could be large. EPA has estimated in a recently proposed NESHAP for benzene that a one-in-a-million (10^{-6}) risk target for benzene could virtually shut down all chemical plants in the U.S. that handle benzene, based on the conservative risk assessment methodologies currently employed by the Agency.⁴ Even the one-in-ten thousand (10^{-4}) risk goal specified in S-816 could create severe economic impacts. The EPA estimates in the preamble to the proposed benzene NESHAP that a 10^{-4} risk requirement could shut down 100 out of 131 plants considered in the benzene fugitive emission/equipment leak source category.⁵

API therefore strongly recommends that the residual risk

⁴ EPA proposed rule for benzene NESHAP, 53 Fed. Reg. 28496 - 28592 (July 28, 1988). On Summary Table I-3 (pg. 28501), EPA estimates that for the proposed one-in-a-million risk limit option (Approach D) all 131 plants considered in the benzene fugitive emission/equipment leak source category would be closed with a loss of roughly 35,000 jobs directly associated with plant operations.

⁵ Ibid.

provisions outlined in S-1490 be adopted instead of the rigid provisions specified in S-816.

F. Permitting System and Compliance Schedule

Provision should be made in the legislation for EPA, states and regulated sources to have an adequate time period of at least three years to develop and implement requirements, consistent with the availability of technology, engineering, and construction resources, and consistent with legislative goals. To the extent feasible, existing permitting systems should be retained to avoid unnecessary permitting delays and impediments. Adequate provision should be made for netting and bubbling. General permits or permit by rule should be utilized for repetitive class permits. Governmental inability to process permits in an expeditious manner should not penalize the prospective permittee, and adequate time for compliance, taking into account permit process needs, should be provided in the legislation.

API strongly recommends that the permit programs specified in S-816 and S-1490 (Title IV) be modified. Numerous delays and potential for disruption of facility operations exist as

proposed. This is especially true since area sources as well as major sources appear to have the same complex permitting requirements in both bills. API recommends that, at the very least, if permit by rule or general permits are not adopted, that the duration of the permit period be extended to at least seven years to match our timing recommendation for the residual risk requirement. A fee structure paid by the permittees should also be avoided.

API is particularly troubled by the provision in S-816 for owners/operators to establish by a best professional judgement approach what controls are required on their facilities if EPA is late in doing its job of establishing standards for a source category or subcategory. The provision is especially troublesome since the next round of permitting could require different control technology for the facilities if EPA develops different requirements for the source category or subcategory.

Owners/operators should not be subjected to potentially excessive and unreasonable controls because EPA defaults in meeting its objectives. This provision in S-816 should be deleted from any proposed legislation adopted by the Senate.

One last point concerning the permit provisions specific to

S-816: it appears that the Administrator may suspend temporary permits without granting procedural rights to the owner/operator of a facility. In addition, no procedures are given in S-816 for issuance of temporary permits. API believes that procedural rights should be provided in the case of suspended permits, and that the permittee should have opportunity for a hearing or other means to contest denial of permits.

G. Catastrophic Release Requirements

Air toxics legislation under Section 112 of the Clean Air Act should consider only routine or continuous toxic air pollutant releases. Consideration for catastrophic releases, including process design criteria, has been made separately under SARA Title III or under process hazard management provisions of OSHA.

SARA Sections 301 to 305 currently address catastrophic emergency release reporting, planning and prevention programs. Emergency planning and response jurisdiction currently falls in SARA Title III to Local Emergency Planning Committees, State Emergency Response Commissions, and the National Response Center. Provision for catastrophic release prevention under CAA Section 112, as proposed in S-816, would overlap these efforts, leading to

administrative and jurisdictional disputes, duplicative regulation and compliance requirements on facilities, and wasteful allocation of limited government resources.

In this regard, the provisions under Title VII of S-1490 are far preferable to S-816 in specifying an Investigation Board at EPA for major life threatening releases of air pollutants. S-1490 appears to better recognize the current emergency planning and release reporting requirements under SARA Title III, and the process hazard management activities currently underway at OSHA that adequately address catastrophic release concerns.

API believes that both S-816 and S-1490 could be improved by including provision to foster cooperation between EPA and OSHA in developing SARA Title III and OSHA process management requirements. We recommend that an interagency commission be specified in the legislation to improve and expedite requirements currently mandated. In this way administrative and jurisdictional conflicts can be avoided and catastrophic release provisions more efficiently developed under existing legislation.

V. COST IMPLICATIONS OF THE PROPOSED LEGISLATION

API has begun to address the potential cost of proposed air toxics legislation on the petroleum industry. The API study addresses the cost of controls on the four major petroleum sectors including refining, production, marketing, and transportation. Our preliminary estimates suggest that the costs of proposed legislation will be higher than any estimates we have reviewed so far for any industry. Total capital costs to the petroleum industry are estimated to range from about \$15 billion to \$68 billion. Total annualized costs could range from about \$3 billion to as high as \$19 billion if all petroleum sectors are severely impacted with a 5 year permit life requirement.

The costs anticipated for each sector in the petroleum industry are included in Table 1. Both capital costs and annualized costs are addressed. Annualized costs include estimates for operating and maintenance costs. At the low end of the cost range (Case I), the estimates reflect air toxic control measures equivalent to controls required now in California for ozone nonattainment. At the high end of the cost range (Case II), the estimates reflect additional costs beyond Case I where MACT is interpreted to require technologies which are currently experimental or not otherwise in significant commercial use. A combined scenario

where both Case I and Case II are required, such as for a very stringent MACT requirement, would result in adding the costs of Case I and Case II together.

Although these estimates are preliminary, we believe the figures represent a reasonable estimate of the ranges of the likely costs of the proposed bills if all facilities in the petroleum sectors install the controls needed to satisfy MACT requirements. These estimates do not take into account facilities ceasing operations or limiting output to reduce emissions. For example, preliminary estimates suggest that as many as 175,000 domestic small production "stripper wells" of two barrel per day or less output could shut down if required to install extensive controls. Secondly, no attempt has yet been made to assess the cost of a residual risk determination after initial technology based controls are in place. Residual risk controls could be extremely costly and result in significant economic impacts.

API believes that Congress should consider the total costs of this legislation compared to the benefits obtained, before the legislation is signed. For example, do the limited health benefits anticipated for stringent MACT requirements justify the potential impact on our nation of ceasing many industrial

operations and exporting jobs overseas, of reducing domestic oil production and decreasing domestic refining capacity? We question those trade-offs.

Table 1

SUMMARY OF AIR TOXICS EMISSIONS CONTROL COSTS

(Billion \$)

SECTOR	CASE I	CASE II
Production	8.6	27.0
Transportation	0.9	3.0
Refining	1.3	13.9
Marketing	4.4	9.2
-----	-----	-----
Total ⁶	15.2	53.0
Annualized Cost ⁷	3.2	9.6

⁶ Total Capital costs for Case I and Case II combined would be additive, or approximately \$68 billion. Columns may not add up to totals due to rounding error.

⁷ Annualized costs presented assume a full useful life generally of 10 to 20 years depending on the type of

VI. CONCLUSION

In conclusion, API emphasizes the importance of developing air toxics legislation that regulates significant sources of hazardous air pollutants, with reasonable technology based control requirements, implementation deadlines, and permitting procedures. S-816 and S-1490 represent a first step towards developing approaches to reducing the nation's remaining air toxics emissions. The following concepts in legislation will further these goals:

- o Source categories that pose the greatest potential risk should be regulated first, with the criteria for setting priorities based on toxicity, population exposure, quantity of emissions, geographic remoteness of emission sources, the relative contribution of other sources to exposure, and the present degree of controls.

equipment. If a five year permit life is assumed that results in a replacement of equipment every five years, the annualized cost would increase to \$4.7 billion for Case I and \$14.4 billion for Case II, or a combined cost (Case I plus Case II) of \$19.1 billion.

- o Exclusion provisions should be included so that facilities that have emissions inconsequential to public health can be exempt from technology based controls.
- o Reasonable technology-based controls should be mandated based on commercially available equipment, and "benchmarked" by a representative sample of 20 percent of the best performing facilities in a source category. Allowance should be made in the legislation for at least 10 years of usable life for pollution control equipment before additional controls are required.
- o Area sources should be considered separately from major sources in air toxics legislation, with area source controls based on GACT where a demonstration of unreasonable risk is made in the localities of concern.
- o Provision for residual risk requirements should be geared to individual facilities, and allow EPA discretion in determining unreasonable risk criteria within each source category.

- o Permitting systems be based where possible on existing permit systems, permit by rule, or by general permits.
- o Catastrophic release provisions should not be included in air toxics amendments, but rather considered under either SARA Title III or in process hazard management provisions of OSHA.

Thank you for your time and consideration.

STATEMENT OF

BENJAMIN Y. COOPER
SENIOR VICE PRESIDENT

PRINTING INDUSTRIES OF AMERICA, INC.
ARLINGTON, VIRGINIA

ON BEHALF OF

THE CLEAN AIR WORKING GROUP (CAWG)

ON

REAUTHORIZATION OF THE CLEAN AIR ACT
(S. 816)

BEFORE THE

ENVIRONMENT AND PUBLIC WORKS SUBCOMMITTEE ON
SENATE ENVIRONMENTAL PROTECTION

SEPTEMBER 21, 1989

My name is Benjamin Y. Cooper. I am Senior Vice President of the Printing Industries of America located in Arlington, Virginia. We represent approximately 20,000 companies in the printing and graphic arts industry. First of all, I would like to thank you for allowing me to testify today about the problems that small businesses will have in implementing the requirements of the Clean Air Act reauthorization encompassed in S. 816. I appear here today as a representative for the numerous small businesses who are members of the Clean Air Working Group (CAWG).

CAWG's umbrella embraces such small businesses as metal, finishers, furniture manufacturers, wood preservers and drycleaners. Other members include agricultural producers, such as citrus, wheat and cotton growers. Let me say at the outset that CAWG supports the goal of the Clean Air Act: to protect public health and air quality in the most cost effective way possible. However, we fear stringent and technologically infeasible regulation under this legislative proposal. Small businesses are not heavily capitalized nor do they maintain sizeable reserves for pollution controls.

Though S. 816 does not specifically address volatile organic compounds (VOCs), it does recommend the study of VOCs (Subsection (k)(2)). Further, the definition of hazardous air pollutants appears to be broad enough to include both toxics and VOCs.

Let me first address how S. 816 would affect the printing industry, an industry which is composed of approximately 36,000 businesses across the country, about 80 percent of which have less than 20 employees. Like most small businesspeople, printers almost always live in the communities they serve, so it is in their best interest to have clean air. However, most small business operators, such as printers, are unclear as to what steps they must take to achieve this goal. It is difficult for them to comply with regulations that do not reflect their unique small business situations. Small operators have neither the technical capabilities nor the human resources to devote to complying with these requirements. In my role as Senior Vice President of PIA, I have been working with several trade associations to develop a proposal that would assist the small business community.

If we use an average-sized printing plant as a model for small business, we will see that the job of environmental compliance often falls on the individual owner, whose first priority is to run his or her business. Most owners simply cannot devote the necessary hours to fully understand and properly implement these requirements. However, if that business had access to technical expertise through a small generator technology assistance program, operated at the state level, the goals of the Clean Air Act could be achieved by these small operators. Such an office, could provide information on equipment, products, methods and funding to help the small businessperson plan a strategy to

reduce the emissions of toxic and volatile organic materials, and do so without being an adversary to that small business.

We are not asking for an exemption for any business. Rather, we are looking for a means of compliance which will allow flexibility. One of the difficulties with S. 816 is the threshold for "major source", which is set at 10 tons per year for a single pollutant or 25 tons per year for a combination of pollutants. It is our view that, for the printing industry, this would throw virtually every printer into the major source category with all the requirements that entails. The small printers would probably not be able to utilize the best available technology. We expect that this would force many of them into noncompliance and possibly out of business. Allowing the major source threshold to remain as it is in the current version of the Clean Air Act, plus the institution of a small generator technology assistance program, would accomplish the goals of the act and allow small businesses to continue to prosper, and contribute to their local, state and national economies.

What is the "Small Generator Technology Assistance Program?" It is a non-adversarial state entity with several important functions (see Attachment A). First, it would provide information on products that are environmentally responsible, equipment which would release the least amount of toxics, and methods of operation which would control releases to the air. Second, this

office would be able to use this information to help individuals set up a plan for reducing emissions which is practical and economically achievable. Finally, such an office, as a state entity, could enter into a formal agreement with the business to make the mutually agreed upon plan a part of the operating permit for the facility.

The seeds for the office described above are already contained in S. 816, and they only need to be used to achieve the results. Proposed Section 112 (h)(1)(A) says, if it is not feasible to prescribe a source category emissions standard the administrator may instead promulgate design, equipment, work practice or operational standards or a combination thereof. Proposed Section (1)(3), states that the Administrator should establish an air toxics clearinghouse, control center technology and risk information center. These two sections provide much of the information needed by a technology assistance center. The grants provided for in subsection (1)(4) for program development and implementation could provide partial funding, and a user fee to be set by the state could yield additional support for the program.

Under information transfer provisions (h)(1)(A) and (1)(3), the Environmental Protection Agency could develop a number of alternative technology guidelines -- not just the best available technique for control of air emissions, but a variety of methods

which could be used in a number of circumstances. Information from the EPA could then be provided to each state for use in its technology assistance office. The formation of the office could be established as a requirement of an acceptable state implementation plan, and the state could be provided with at least two possibilities for paying for the establishment of such an office. Most importantly, information would be allowed to flow to the users who need it the most.

This legislation has generated several other concerns in the small business community; I will simply mention two. First, the area source definition's ambiguous nature could, by default, include anything and everything. Thus, an area source could encompass all gas stations, all bakeries, all drycleaners, all paint shops -- perhaps almost all hardware stores -- even all automobiles, and so forth. The small generator technology assistance program, if implemented correctly, would obviate the need for area sources and would prevent treating all companies and businesses as though they were one single source.

Second, small business industries or agricultural producers which potentially could be controlled as area or major sources may already be regulated under a variety of other environmental, as well as workplace-protection statutes. In having to comply with clean air regulations, small businesses and agricultural producers could be put in the position of noncompliance and in

violation of these other statutes. Attached to my testimony are specific examples of this situation (see Attachment B).

This concludes my oral testimony. CAWG is appreciative of this opportunity to express some small business concerns. The committee should expect to receive additional written testimony from the American Furniture Manufacturers Association, American Textile Manufacturers Institute, Inc., Alliance Textile Care Association, National Association of Metal Finishers, and Screen Printing Association, Inc. on the potential impacts of S. 816 on small business. I will be happy to answer any questions that you may have.

w:l7lcmw9999.89

ATTACHMENT A**SMALL GENERATOR TECHNOLOGY ASSISTANCE
PROPOSAL**

Businesses which generate small quantities of air emissions will be the focus of the new Clean Air Act Amendments as the continued reduction of the major sources becomes more difficult and less cost effective. These small quantity generators, however, tend to be businesses which cannot necessarily meet mandated percentage reductions because they lack the technical resources to evaluate control techniques, because they lack economic flexibility to experiment or invest in several alternatives and because they are dependent on their suppliers for environmentally safe materials.

This group of small generators face a quandary: they might want to reduce emissions to the air, but they do not know how to do so. The Best Available Technology is often too costly in terms of initial investment and operation for a business of limited size. Environmentally safe materials may not work or may need experimentation to make them work properly. Methods which are applicable to large operations may require time and resources to adapt them to small ones. Overall the problem is that small businesses do not have the technical capability or the time to meet potential requirements and schedules set out in Clean Air Act amendments.

Lowering the "major source" threshold from 100 tons per year will tend to reduce the number of options available to small generators, and may well drive many of them out of business or toward voluntary non-compliance. This proposal (attached) for the establishment of Small Generator Technology Assistance offices at a State level adds flexibility to the means available for meeting the goals and spirit of the Clean Air Act. States could use information assembled by U.S. EPA in their derivation of alternative technology guidelines for each industry. These alternatives could be adapted for local conditions, requirements and capabilities. The end result would be reduction in emissions by all segments, even those which are not presently covered by the Clean Air Act. Those advances would be made voluntarily (more or less) with a minimum of economic disruption and a maximum of equity.

The Small Generator Technology Assistance Proposal was developed by Printing Industries of America in cooperation with the American Furniture Manufacturers Association and the National Federation of Independent Business.

The Proposal has recently been endorsed by the Small Business Legislative Council (SBLC), a permanent independent coalition of nearly one hundred trade and professional associations that share a common commitment to the future of small business. The members represent the interests of over four million small businesses.

For More Information, Contact

Tom Purcell
Printing Industries of America, Inc.
1730 North Lynn Street
Arlington, VA 22209
(703) 841-8114

Barbara Steakley
American Furniture Manufacturers Association
918 16th Street, N.W.
Suite 402
Washington, DC 20006
(202) 466-7362

Donna Singletary
National Federation of Independent Business
600 Maryland Avenue, S.W.
Washington, DC 20024
(202) 554-9000

**Outline for Establishment of Small Generator Technology
Assistance Under the Clean Air Act**

1. Limitations.

Any plant emitting less than 100 tons of VOC and/or toxic air pollutant per year and which does not have the technical ability or knowledge to achieve reduction of the emissions could participate.

2. Small Generator Technical Assistance Entity (Entity)

The State Government will establish an office or Entity which will serve as a focus for transfer of technological assistance to small generators, and will promote compliance with environmental regulations. The development of an alternative pathway to lowering air emissions will move so-called "area sources" to reduce emissions. In order to accomplish this the Entity will have several functions:

A. It will be able to audit the process systems of the firms requesting assistance in meeting the requirements of the Clean Air Act (CAA);

B. It will provide information on alternative technologies, including equipment, chemical products and methods of operation, which will help reduce air pollution;

C. It will discuss and negotiate a suitable plan and schedule for reduction of air emissions (VOC and toxic) to achieve the best reduction possible, taking into account the economic feasibility and technological capability of the individual firm in question.

This Entity will be established to assist small generators in meeting environmental goals. It would not be required to report audit results or contents of discussions to enforcement agencies unless the firm in question was not operating in a good faith effort to comply. Alternative Technology Plans (Plan(s)), established on the basis of the requirements and abilities of the firm, would be used in permitting/licensing a specific firm, but could be applicable with modification to a broad category of similar firms. Credit could be given to States which incorporate an acceptable technical assistance plan in their SIP.

3. Pathways.

A. A small generator could formulate a Plan and schedule to institute the controls given in the appropriate national guidelines (e.g. CTG) or other techniques which may be reasonable. This Plan would achieve reduction of VOC and toxic emissions to the environment, the amount of this reduction to be based on the present emissions of the plant, and would be subject to approval by the Small Generator Technical Assistance Entity and the State licensing agency.

or,

B. A small generator could request technical assistance from the State Entity in formulating a mutually agreed upon Plan and schedule for reduction of emissions to the environment using practical and economically reasonable techniques.

ATTACHMENT B

Small business industries or agricultural producers which potentially could be controlled as area or major sources may already be regulated under a variety of other environmental, as well as workplace-protection statutes. In having to comply with clean air regulations, small businesses and agricultural producers could be put in the position of violating these other statutes.

For example, pineapple growers are required to comply with the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). FIFRA requires the specific pesticide application instructions which are placed on the label of a pesticide container. These labeling requirements contain several specifications. It is a criminal act, with stringent penalties imposed, to apply pesticides in a manner inconsistent with their labeling directions. For example, frutone, a pesticide which regulates the growth of pineapples, has specific instructions from the manufacturer such as the dosage rate, method, frequency and timing of a application. Deviations from these instructions are not permitted except under rare circumstances. Therefore, pineapple growers, who would be required under the proposed Clean Air Act revisions to use less of the required dosage of pesticide applied to the fruit, would be out of compliance with the FIFRA regulations. To remain in compliance with both statutes, growers would have to take drastic actions such as reducing the amount of acreage under cultivation. Growers might also be required to go through the

extensive and expensive process of requesting a label change which would have to be conducted through a lengthy rulemaking procedure.

Let me give you another example of how S. 816 could impact small manufacturers. The furniture industry's finishing process is heavily regulated by the Occupational Safety and Health Administration (OSHA). The process of furniture finishing is critical because the appearance of the product is essential for consumer acceptance. Each step involves the application of separate finishes (glazes, stains, topcoats, lacquers, sealers, and the like) by a worker using a spray gun in a spray booth. The average number of steps is ten, and can be as many as seventeen or more.

The finishes use solvents as agents to dissolve solids into the wood. The precise mixture used in any given application is critical to control finish quality, durability, appearance and drying time between applications. Furniture finishing emissions are volatile organic compounds, and have faced ozone regulation in several states. The solvents are also considered air toxics.

The furniture finisher has three basic options for further control of emissions: reformulation to water-based finishes, add-on controls such as incinerators and carbon absorption systems or application technology. Successful reformulation to water-based finishes has so far proved elusive on an

industry-wide basis. Existing water-based finishes pose difficult technical problems and, most importantly, simply do not yield a finish acceptable to the American consumer.

The second option involves the use of add-on controls, incinerators or carbon absorption systems, which have both technical and economic problems. As mentioned, furniture finishes are directly applied by workers, and OSHA tells these manufacturers that they must move air through the spray booths at a rate of 100 cubic feet per minute for worker protection. As a result, the air contains a very low proportion of one or more pollutants, and would require substantial amounts of expensive fuel for complete incineration. Incineration of finishing materials in a wood furniture plant also could be a substantial fire safety problem.

Of the three, application technology is the only one which is economically and technically viable. Improving spray gun technology, at significant cost, coupled with enhanced operator training, can yield reductions in the ten to twenty percent range.

One plant, with 185 employees and 11 spray booths, producing approximately \$11 million in furniture annually, obtained an estimate for incinerators -- \$250,000 per spray booth or \$3 million for that facility alone. The story is much the same for carbon absorption systems, with the added complication that

certain solvents common to the industry may impair the operation of carbon systems, as do conditions of high humidity.

w:172cmw9999.89



CALIFORNIA ASSOCIATION of SANITATION AGENCIES

825 L Street

Suite 600

Sacramento, CA 95814

Telephone (916) 446-0388

President

RAYMOND C. MILLER
 South Coast Water District
 31592 West Street
 Laguna Beach, CA 92677
 (714) 499-4555

Secretary-Treasurer

CHARLES A. JOSEPH
 Novato Sanitary District
 500 Davidson Street
 Novato, CA 94945
 (415) 892-1694

1st Vice President

ARTHUR VARGAS
 Castro Valley

2nd Vice President

JOHN WIPER
 Moulton Niguel

DIRECTORS AT LARGE

WALTER BISHOP
 E.B.M.U.D.

ANNE DUNIHUE
 Chico Basin

JOYCE GWIDT
 Irvine Ranch

FRANK SOLOMON
 Las Gallinas Valley

ACTIVE PAST PRESIDENTS

DEIRDRE CANNATA
CHARLES W. CARRY
PARKE L. BONEYSTEELE
MICHAEL ZAMBORY
JERRY D. SMITH
ELBERT W. TRANTOW
ROGER J. DOLAN
WAYNE SYLVESTER
DR. JOSEPH F. BROWN

MICHAEL F. DILLON
 Executive Director &
 Legislative Advocate
 925 L Street, Suite 600
 Sacramento, CA 95814

TESTIMONY OF THE
CALIFORNIA ASSOCIATION OF SANITATION AGENCIES
PRESENTED TO
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
UNITED STATES SENATE

PRESENTED BY
ROBERT P. MIELE
DEPARTMENT HEAD, TECHNICAL SERVICES
COUNTY SANITATION DISTRICTS OF LOS ANGELES
COUNTY
ON BEHALF OF
RAYMOND C. MILLER
PRESIDENT

CALIFORNIA ASSOCIATION OF SANITATION AGENCIES

SEPTEMBER 21, 1989

Mr. Chairman and members of the Subcommittee, I am Robert P. Miele, Department Head, Technical Services, Country Sanitation Districts of Los Angeles County. On behalf of CASA, thank you for allowing us to present our views on legislative proposals to control toxic air emissions. I also want to express our apologies that CASA's President, Raymond C. Miller, was unable to present this testimony. Because of an earlier commitment he was prevented from delivering this testimony.

CASA is an association of 89 wastewater treatment agencies within California. Our members collectively serve more than 12 million people and the related industrial and commercial facilities throughout California. Since 1987, CASA has worked to promote sound public policy related to the implementation of water pollution programs mandated by the Clean Water Act.

The State of California has been on the cutting edge of efforts to improve air quality. In recent years, wastewater treatment agencies have been drawn into this regulatory effort principally because of public concern over air toxics. Many of CASA's members work with state and regional air boards as these agencies develop the regulatory framework to improve air quality.

In Southern California, the major wastewater treatment agencies have joined with the South Coast Air Quality Management District and the State Water Quality Control Board in a Task Force which has been working for over a year on the issue of air toxic emissions from wastewater treatment plants. Similar effort have begun in other parts of the state. Thus, CASA believes it is qualified to present its views and recommendations on how to control air toxic emissions that may be attributable to wastewater treatment plants (POTWs).

CASA applauds your Committee's efforts to develop legislation to prevent the release of toxic materials into the atmosphere in concentrations that may have adverse public health impacts. We feel that your draft legislation is a good start in that direction. However, because of the special circumstances related to wastewater treatment facilities, which I will explain throughout this testimony, we believe that care must be taken in applying air toxic control measures to these facilities.

The Toxics Prevention Act of 1989 (S. 816), would regulate POTWs as either area sources or major sources of air toxics, depending on the levels of emissions. The Administration legislation, the Clean Air Act Amendments of 1989 (S. 1490), would regulate POTWs in a similar manner. Each would require changes to comply with emission reduction standards.

AIR EMISSION AND THE NEED TO CONSIDER THE POTW'S UNIQUE SITUATION

Unlike most other sources of air toxics, POTWs provide a public service, namely, wastewater treatment. Any requirements to control air emissions must not subordinate the priority mission of POTWs to control water pollution. As the Senate committee charged with the responsibility to ensure protection of both our air quality and our water quality, you are acutely aware of this fact and, thus I would hope that you will seek innovative ways to address air issues which avoid disruption of water quality programs.

Another unique feature of POTWs is that they are not generators of air toxics -- they are receivers of materials which can become air toxics. The presence

of air toxics at POTWs is attributable to several sources:

(1) industrial discharges to the POTW, (2) federal or state regulations requiring the use of chemicals to purify water supplies (for example chlorine), and (3) the use of common household products such as bleach, paint strippers, toilet bowl cleaners, etc.

Regulating air emission from POTWs is complicated for several reasons:

- o Because POTWs are designed for water pollution control, the technology does not lend itself easily to air emission controls. POTWs cannot simply attach control technology to a "smoke stack". For example, conventional wastewater processes employ aeration to ensure proper and efficient treatment. Ironically, this necessary agitation may contribute to the potential for increased air emissions. To date, there is no proven technology to remove very low concentrations of air toxics from large volumes of air, which is the situation that exists in aeration basins at a POTW.
- o POTWs must accept wastewaters from residential and industrial discharges. POTWs do not have total control over their "raw materials" and thus, the nature and extent of air emissions from POTWs can vary on daily basis. However, POTWs do have the authority to regulate the discharges from industry into their system.

AN APPROACH TO CONTROL AIR TOXIC EMISSION FROM POTWS

Because air regulatory agencies in California have been discussing air toxics for the past several years, many CASA agencies have been conducting research on the nature and extent of toxic emissions that may emanate from their

treatment facilities. I believe that California POTWs have considerably more data than other POTWs in the country and yet the data in California is inadequate. Sufficient work has not yet been done to determine the characteristics and sources of substances found in municipal wastewater that contribute to toxic air emissions. Sampling and analytical methodologies have not been standardized. Without this information, it is not possible to even estimate the potential public health impact of toxic air emissions from POTWs. Further, there is more effort needed to assess the potential for industrial pretreatment programs to prevent the discharge of potential air toxicants into the sewer. In addition, new Clean Water Act initiatives contained in the 1987 Amendments related to sludge regulation (Section 405) and categorical standards on industrial sources (Section 304(m)) may have the incidental affect of removing air toxicants before they reach the sewers.

In addition, little, if any, research has been done to develop control technologies at the POTWs for air toxicants which cannot be source controlled. As stated earlier, wastewater treatment facilities are not designed for control of air emissions. In some cases, treatment process work to promote air emissions. Considerable effort must be devoted to develop cost effective systems to collect and treat air emissions from POTWs.

We are troubled over the absence of any directive in the proposed legislation for the EPA to work with POTWs to obtain the information required to address the above issues so that EPA can develop meaningful regulations. In discussions with EPA and Senate staff members, we get the sense that POTWs may be regulated in the "second tier" of categories of major sources under your proposed legislation. If, in fact, POTWs will not be regulated in the first

group, CASA believes the intervening time should be used to design a program to develop the above information.

CASA, therefore, urges the Committee to develop legislation that recognized the unique nature of air toxic emissions from POTWs. Specifically, CASA recommends that EPA be mandated to develop a program to control air toxic emissions from POTWs which contain the following elements:

- o develop uniform sampling, analytical, modeling, and risk assessment methods to assess the magnitude of toxic air emissions from POTWs and their potential for adverse health impacts
- o assess the effectiveness of industrial source control in reducing air toxic emissions from POTWs
- o conduct cooperative demonstration projects with representative POTWs to develop air toxics control technology while minimizing cross-media/cross programs conflicts
- o once the above has been completed, develop "technology-based standards" which the following components:
 - a. amending industrial pretreatment programs to take into account measures to control specific toxics
 - b. directing the use of equipment and treatment processes to control emissions that have been demonstrated through cooperative demonstration projects.

- c. relying on measures targeting waste minimization, product bans, and substitutions

Mr. Chairman, this completes my testimony. I have attached a copy of a comprehensive report on air toxics and California POTWs. This report will provide additional information on our efforts to develop a workable program to control toxic air emissions. We stand ready to work with you and the Committee to ensure timely control of any toxic air emission that jeopardize public health. I would be happy to answer any questions.

S. 816

TOXICS RELEASE PREVENTION ACT OF 1989

Control of Hazardous Pollutants from Toxic
Chemical Accidents, Major Emitting
Facilities, Area Sources and Motor Vehicles

Testimony of

ROBERT ABRAMS

Attorney General of the State of New York

- before the

Subcommittee on Environmental Protection
Committee on Environment and Public Works
United States Senate

September 21, 1989

TESTIMONY OF ROBERT ABRAMS
ATTORNEY GENERAL OF NEW YORK

TOXIC RELEASE PREVENTION ACT OF 1989

Air pollution is the principle cause of human exposure to toxic substances. Nearly two years ago, a report of this Committee found that cancer rates near industrial facilities and urban areas were frighteningly high. Today airborne hazards continue to cause premature death, chronic illness, and misery to millions of Americans. Many communities are continually shrouded in plumes of toxic compounds, even as they lie unprotected from a chemical accident that could suddenly turn a neighborhood into an American Bhopal. While people on the streets

of our cities are routinely choked by carcinogenic clouds of diesel bus exhaust, the Great Lakes are being bombarded with tons of toxic fallout.

The people of this nation overwhelmingly support prompt, forceful action to clean up our air, water, and soil. Polls show that 75 to 80% of Americans believe that laws against pollution are too weak and that environmental quality must be improved regardless of cost.¹

For the past eight years, my office has been part of a difficult and often

¹New York Times/CBS News poll, conducted in June, 1989, reported in the New York Times, July 2, 1989, page 1; Media General and Associated Press Survey conducted in May, 1989, reported in Associated Press articles of May 23, 1989.

3.

frustrating campaign to reform this nation's air pollution policies. We are finally on the verge of a breakthrough. I have publicly applauded the President's pledge to "clean up air toxics" and his goal "to prevent public exposure to cancer causing agents," by requiring the use of "the most advanced technology available," to clean up our air. I agree with his proposal to cut air toxics by 75% in a decade and thereafter to eliminate all remaining risks to health from air toxics through a second phase of regulation.

Unfortunately, I find that the Administration's proposed legislation, S. 1490, falls short of these admirable goals. This Committee's bill, S. 816, is a

4.

far superior approach. With a few changes this bill could become an enforceable and comprehensive mandate to achieve the aspirations we share with the President.

We need an enforceable air toxics law. In seven crucial areas, the Administration's bill gives EPA such wide discretion that states and citizen groups would have no legal recourse to force the agency to carry out the purposes of the law.²

²See, § 112(b)(2)(A) (additions to the hazardous pollutant list are discretionary/); 112(c)(1) (review and revision of the source category list are discretionary/); 112(d)(1) (existing sources need only be controlled as well as the best controlled similar sources, even for source categories that are poorly controlled throughout the industry/); 112(e)(1)(D) (discretion not to promulgate
(Footnote Continued)

5.

For the most part, S. 816 contains the necessary deadlines and mandatory language to prevent another decade of agency inaction and judicial indifference. I strongly recommend, however, that the bill be amended to insure that standards for existing sources of air pollution do not become so weak as to be meaningless. Existing sources, after all, are the problem. The suggestive "benchmark" of 90% reduction will leave EPA free to set

(Footnote Continued)
standards for 50% of listed source categories); 112(f) (nearly complete discretion not to undertake residual risk analysis and standard setting with cost allowed as a factor to balance against health); 402(d) (discretionary sanctions for failure of a state to submit a plan); 202(i)(2) (Administration "may" promulgate mobile source air toxics regulations)

permissive standards.³ The bill should flatly require existing sources to reduce uncontrolled emissions by at least 90%.

The enforceability of S. 816 would also be greatly enhanced by clearly requiring sources to self-monitor and report their emissions. This would make the Clean Air Act, like the Clean Water Act, a great deal more enforceable by government and citizens.

I also urge the Subcommittee to adopt the provisions from the Leland/Molinari bill, H.R. 2585, to protect the Great Lakes from air toxics deposition and to clamp down on mobile source air toxics. Enactment of

³Section 112(d)(3).

strong controls on existing diesel bus exhaust may be the single most important -- and most appreciated -- action you can take on behalf of beleaguered city dwellers.

A recent EPA survey found that chemical accidents potentially more toxic than the 1984 Bhopal, India disaster -- which killed 3,400 people and injured 200,000 -- have occurred in this country at least 17 times! What saved our citizens? The answer of one EPA official was "The way the wind was blowing."

Many chemicals now in use can form toxic gas clouds when released, clouds that can travel fast and cover a large area. In a report prepared by my office entitled "New York Under a Toxic Cloud", we found that most

New Yorkers live in "vulnerable zones" that could be engulfed in toxic clouds within minutes. In these circumstances, emergency response measures are ineffective and the only way to protect people is to prevent accidents from happening in the first place.

Between 1983 and 1988, over 3,000 accidents were reported in New York State alone, killing 26 people and injuring over 500, while forcing thousands to evacuate their homes and workplaces. Governor Cuomo and I have proposed State toxic accident prevention legislation, but its passage has been blocked so far by opponents who argue that it would put New York industry at a competitive disadvantage in the absence of Federal action.

In contrast to the Administration's bill, S. 816 takes a significant step toward a sound toxic accident prevention policy by requiring facilities handling certain toxic chemicals to identify the hazards posed. However, the bill should be amended to require facilities to take the next and most important step -- to prepare and implement accident prevention plans for the dangers identified. S. 816 should be amended to require these regulations, at least for those industries most susceptible to catastrophic accidents. H.R. 2585 contains some excellent mandatory prevention planning and implementation language that should be added to S. 816.

Finally, a word about incinerators. After many years of litigation my office and the Natural Resources Defense Council (NRDC) have finally committed EPA to issue national incinerator regulations under Section 111 of the Clean Air Act. Unfortunately, the signals are that anti-regulatory forces within EPA and OMB may kill proposals to require nitrogen oxide controls, scrubbers and recycling to reduce all emissions. If weak regulations are proposed at the end of this year, I urge you to consider enacting a strengthened version of S. 196.

In conclusion, we must rescue Americans from assault by toxic chemicals in the air. We cannot rely on vague laws and good luck to protect people from routine toxic emissions

or continue to play Russian Roulette with preventable toxic chemical accidents.

Statement
on
Clean Air Act: Toxic Air Pollutant Controls

The Alliance of Textile Care Associations (ATCA) appreciates the opportunity to offer written comments on potential amendments to the Clean Air Act to further regulate toxic air pollution.

ATCA is a coalition of six national trade associations representing all segments of the predominantly small business laundry and drycleaning industry nationwide. This service industry consists of establishments employing many thousands across this country in both urban and rural communities.

ATCA is in full agreement with other industry representatives who have encouraged that the many factors that affect potential health effects of airborne emissions be carefully assessed using sound scientific principles in establishing suitable control strategies. These factors include duration and concentration of exposure and the pathway of exposure. Legislative provisions should mandate that the Environmental Protection Agency (EPA) assess these factors in promulgating emission control requirements for substances and source categories that exceed de minimis criteria.

ATCA's primary interest and concern with potential amendments to the Clean Air Act are those dealing with the imposition of toxic air emission control requirements on small sources of such emissions, so-called area sources. Since, by definition, these are sources of only small quantities of ambient emissions of chemical substances, individually these are unlikely to pose any significant risk to human health. Adequate emissions reductions by area sources should generally be achievable through use of cost effective and generally available control technologies, to lessen already small risks to human health. For many small emissions sources, as are prevalent in the laundry and drycleaning industry, generally available emission control technology is the only feasible mandated reduction requirement, at least for near term implementation.

Widely recognized is the fact that the cost burden of pollution control is disproportionately large for small business establishments. In large part this is due to the lack of "economies of scale". In some cases, pollution controls must actually be down-sized for installation in small establishments. Rather than resulting in savings, down-sizing often involves additional cost. Advanced or technology forcing emissions control technologies are not only infeasible for imposition on small emission sources, they would likely be so expensive to install and operate that many small establishments would be forced to close rather than comply.

Statement on Clean Air Act
Page 2

For an industry consisting of numerous small establishments such as the laundry and drycleaning industry, the above circumstance is easily demonstrated. From the standpoint of sheer numbers, new technology cannot be installed in every plant except over a long period. With in excess of 30,000 operating plants in this industry, a decade or more could be required for new equipment to be manufactured and installed industry wide. Any attempt to accelerate the process through establishment of early compliance dates would simply drive up the cost of the equipment as manufacturers attempted to satisfy the demand.

Equipment for this industry, for example a drycleaning machine, has a useful life of 10 to 20 years or more. This long life, in part, explains how a "mom and pop" drycleaner can manage \$35-50,000 for a new machine with annual revenues of only \$100,000 per year. If a small drycleaner were forced to buy replacement equipment within only five years or so, the financial consequences could be devastating.

Facility permitting is another area which is a generally infeasible requirement to impose on small area sources. An obligation for small sources of toxic air emissions to obtain facility permits would impose a burden that would far exceed any benefit to be gained. A small business owner experiences great difficulty in staying informed of regulatory requirements that apply to his or her operation. Using information supplied by a trade association or a manufacturer's representative, generally available emission control devices can be obtained and installed. By contrast, information for completion of a permit application will often necessitate hiring an engineering consultant, an expensive prospect. Even though permit applications from similar small business establishments will be quite similar from a technology standpoint, thousands of applications will be submitted, each necessitating review by the permitting authority. Therefore, not only are permits a needless burden on most small business emission sources, but the scarce resources of permit authorities are diverted from more important responsibilities.

ATCA is also concerned with the treatment in legislative amendments of toxic air contaminants that are suspected carcinogens. The paucity of available scientific evidence can lead to serious errors in both the identification of such substances and in specifying health based control levels. ACTA would view as bad policy the specification in legislation of a maximum risk level for suspected carcinogens for several reasons.

Risk levels which result from risk assessments are frequently misunderstood and are easily misapplied as quantitative bases to support standard setting. Using the same

Statement on Clean Air Act
Page 3

data, different scientists will often conclude a different risk to human health depending on the model and underlying assumptions utilized for performing a risk assessment. Recognizing the speculative nature of risk assessments and the inherent variability in the resulting risk levels, depending upon the selected methodology, it is inappropriate for Congress to select and specify in a statute the required degree of protection for human health in terms of a potential risk to the health of a most exposed individual. By contrast, it is fully appropriate for Congress to direct EPA to establish risk levels and to develop necessary standards to achieve these levels.

ATCA cautions against the tendency to treat all suspected carcinogens alike, especially "possible" and "probable" human carcinogens. Under EPA's risk assessment guidelines, chemicals are generally assigned to the "possible" human carcinogen category on the basis of insufficient evidence of cancer in animals and no evidence of cancer in humans. In other words, there is the possibility that the chemical could contribute to cancer in humans, but the available evidence is equivocal, at best. Even in the case of some probable human carcinogens, there is no evidence of cancer in humans due to exposure to the chemical substance. Therefore, care must be taken to assure that such chemicals are not subjected to controls that would only be appropriate for "known" carcinogens.

ATCA encourages that any consideration of the need for additional control of toxic air pollutants also address other emission reduction requirements. In some areas, ambient air emissions have been or will be subject to controls as communities strive to attain the National Ambient Air Quality Standards for ozone and carbon monoxide. Without due care, emissions sources could be subjected to duplicative or even conflicting control requirements. Similarly, employer attempts to minimize workplace chemical exposures in response to revised standards issued by the Occupational Safety and Health Administration could be hampered if new ambient emission controls are imposed without adequate consideration of the interdependence of occupational and ambient exposures in certain industries.

As has been suggested by other representatives of the small business community, ATCA believes that the provision of technical information and assistance to small business owners and operators is as important in achieving emissions reductions as is the development and implementation of new or revised regulatory control requirements.

WRITTEN TESTIMONY

of

AMERICAN TEXTILE MANUFACTURERS INSTITUTE

on

REAUTHORIZATION OF THE CLEAN AIR ACT

BEFORE THE

SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

OCTOBER 3, 1989

The American Textile Manufacturers Institute, Inc. (ATMI) is the central, nonprofit trade association for the domestic textile industry. Our member companies operate in more than 30 states and represent approximately 85 percent of the nation's capacity for spinning, weaving, tufting, finishing and dyeing of textile products.

These comments address the air toxics, permitting and enforcement provisions from S. 816 and the Administration's proposal on the Clean Air Act reauthorization, S.1490.

ATMI supports the important national goal of protecting human health by controlling emissions of hazardous air pollutants as required by Section 112 of the Clean Air Act. While we believe some amendments to the Clean Air Act may be necessary, we believe neither S. 816 or S. 1490, as presently written, achieves this goal in a reasonable and appropriate manner.

To put our concerns in perspective, it is crucial to have some basic information about the textile industry, which is made up of a wide variety of facilities.

Most of our operating facilities use relatively small amounts of water and chemicals; they weave, spin, knit or otherwise process fibers for finishing. These facilities use chemicals as cleaners, lubricants and, with respect to starch and polyvinyl alcohol, as sizing.

Our significant chemical usage occurs in the dyeing and finishing operations. These facilities use regulated chemicals, some of which are essential to ensuring the fabric's durability, quality and appearance. For example, methyl chloroform is used for such textile specific operations as spot removal and dry cleaning, as well as for such general industrial operations as cleaning and degreasing chemicals. Another example is methanol, which is used as a carrier for naphthol dyes. The methanol is mixed with water and some portion of that mixture is driven off and evaporated. Textile industry emissions are mostly fugitive and highly diluted.

Many textile companies have voluntarily made significant efforts to substitute less toxic chemicals, and to recycle and reuse chemicals. For example, some of our companies are turning to water-based rather than solvent-based (mineral spirits) printing. Further, in preparing fabric for dyeing, we have reduced the use of cleaning solvents which are volatile organic chemicals (VOCs). Finally, our companies use formaldehyde resins (which keep fabric wrinkle- and stretch-resistant) in smaller and smaller quantities. In point of fact, these chemicals are essential to manufacture the types of fabric the American consumers, our customers, demand and expect.

Concerns With Air Toxics Provisions

ATMI believes the Environmental Protection Agency (EPA), not Congress, should be charged with determining which chemicals are subject to regulatory control. The recent publication of the Superfund Amendments and Reauthorization Act of 1986 (SARA, Section 313) toxic release inventory data created substantial public interest in, and concern about, the amount and kinds of chemicals emitted into the nation's air, water, and land. We understand that in years past, the EPA has not always met congressional expectations in implementing statutorily imposed timetables and deadlines.

However, ATMI believes these competing concerns -- granting EPA its traditional and proper authority to list and regulate the appropriate chemicals, while also ensuring prompt regulation of as many chemicals -- can be reconciled.

In lieu of the proposed chemical lists included in S. 816 and S. 1490, we believe EPA should be charged with developing, through rulemaking, a list of chemicals for regulation. If EPA failed to promulgate regulations by a date specified in the legislation, then a chemicals list, contained in the legislation, would as be used by default. In that fashion, those chemicals which are the most toxic, emitted in the greatest quantities and which have the greatest potential exposure problems would be controlled at the outset. Too, if EPA failed to act in a timely fashion, the Agency would be required to rely on the statutorily created list. EPA has, in fact, successfully met tight deadlines, most recently in issuing numerous SARA regulations.

We are quite concerned that major sources would be defined as those emitting ten tons of single listed chemical or 25 tons of a combination of such chemicals. While these numbers may appear significant, the major source definition will result in a substantial number of facilities being subjected to a massive new regulatory control program.

In addition, imposing maximum achievable control technology (MACT) on all major facilities, regardless of the amount, kind and frequency of their chemical emissions, is an unrealistic, burdensome and expensive method of control.

While we support the concept of exempting a facility which has demonstrated reduced emissions, proposed in S. 816 and S. 1490; we believe the concept can be improved. We recommend that companies should be credited for all emissions reductions, as opposed to merely voluntary credits proposed under both bills. More importantly, companies which have achieved some percentage of reduced emissions less than the 90 percent reduction, set forth in both S. 816 and S. 1490, should receive proportional

credit for such reductions. For example, if a company had reduced its emissions by 88 percent, it should be permitted to apply less stringent control technology than that required for a company which had not reduced its emissions.

Although we continue to believe EPA should establish minimum standards to ensure national consistency in the regulatory process, the programs proposed by S. 816 and S. 1490 will not accomplish this important task. Further, given the proposed thresholds of 10 tons/25 tons for major sources, coupled with the nature of the textile industry's emissions, ATMI feels the compliance costs to achieve MACT will be extremely high. Again, imposing MACT on all major facilities, regardless of the amount, kind and frequency of their chemical emissions, is an unrealistic, burdensome and expensive method of control. Rather than try to control all chemical emissions across-the-board, EPA's and state agencies' limited resources should address those chemicals which are the most toxic, emitted in the largest quantities and have the greatest exposure potential to the largest number of people.

Concerns With Permitting and Enforcement Provisions

The permit program proposed by S. 816 and S. 1490 will pose major problems for the regulated community, EPA, and state air quality agencies. ATMI is concerned about the proposed permitting and enforcement provisions in the following ways:

First, requiring all facilities to pay annual fees sufficient to cover all direct and indirect costs of developing and administering the permit program is inappropriate; only direct costs should be assessed to the facilities.

Second, we agree that the permit should be for a fixed period, but believe that five years should be the minimum rather than the maximum time period. We would recommend a ten-year period, given the complex permit system proposed under both S. 816 and S. 1490. In addition, we propose that legislative language be included to allow a permitted facility which has not made significant changes to its processes to go through an expedited, abbreviated permit renewal process.

Third, while we support appropriate enforcement actions against violators of the nation's environmental laws, we believe the \$10,000 daily fine proposed in S. 1490 for any permit violation is excessive. This means that any company which unintentionally failed to maintain compliance records required under the permit system could be so fined. Enforcement actions should be taken against intentional

-4-

polluters, not against those who erred by failing to maintain voluminous records.

Fourth, as proposed in S. 1490, we do not believe that company managers should be required to submit semi-annual, or more frequent, progress reports to the permitting authority. The semi-annual progress report would create another, needless layer of bureaucracy and paperwork. Again, an inadvertent failure to comply with this provision could result in another potential violation of the Act for which the company could be assessed a \$10,000 per day fine.

Conclusion

Our member companies are committed to remaining good corporate citizens and to complying with our nation's environmental laws and regulations. However, unreasonable and overly burdensome legislative initiatives, such as the Clean Air Act legislation presently before the Subcommittee, make it difficult, if not impossible, to accomplish these commitments and to contribute to the growth of the American economy.

Unlike some other industries which will be affected by new Clean Air Act regulations, the domestic textile industry has been and remains severely harmed by import growth. During 1988, 36.7 percent of our domestic textile market was accounted for by imports. This is a higher percentage of import penetration than is found in steel, automobiles or chemicals, industries, like textiles, which are essential to America's industrial might. Our employment figures offer similar insight into the domestic textile industry's problems. For example, in 1988, the textile industry employed 729,000 individuals and, in 1978, 899,000 persons. This represents a 19 percent decrease in employment during the ten year period; in contrast, there was only a five percent decrease in employment in all manufacturing industries during the same period. Clearly, the domestic textile industry, hampered by growing imports, cannot absorb the additional fiscal, administrative and personnel costs which would be incurred if either S. 816 or S. 1490 were enacted as proposed.

In summary, any Clean Air Act legislation reported out of the Environment and Public Works Committee and considered by the full Senate must be able to achieve the twin goals of maintaining a strong and healthy manufacturing economy and improving our nation's air quality. We strongly urge the Subcommittee to consider our recommendations and modify either S. 816 or S. 1490 accordingly.

ATMI appreciates the opportunity to present our views on this important issue and we would be happy to respond to any questions the Subcommittee or Committee may have.

**National Association
of Metal Finishers**

Washington Office:

Suite 700
1101 Connecticut Avenue NW
Washington DC 20036
202/857-1100

William A. Sonntag
Director of Government Relations

an organization of
management executives
in the fields of
metal finishing and allied arts

**WRITTEN STATEMENT OF
THE NATIONAL ASSOCIATION OF METAL FINISHERS**

BEFORE THE
ENVIRONMENTAL PROTECTION SUBCOMMITTEE
OF THE
ENVIRONMENT AND PUBLIC WORKS COMMITTEE
UNITED STATES SENATE

REGARDING
SENATE BILL 816
AIR TOXICS CONTROL
SEPTEMBER 21, 1989

These comments are submitted on behalf of the over 950 member companies of the National Association of Metal Finishers (NAMF), the only organization representing the job-shop metal finishing and electroplating industry.

Metal finishing is the process of coating, a metallic or plastic object with one or more layers of another metal, paint or plastic to furnish its surface with other desired properties such as:

improved appearance	altered dimensions
corrosion resistance	light reflection
abrasion resistance	insulation or conductivity
wear resistance	improved electrical properties
improved lubrication	solderability
non-toxicity	heat and cold resistance

The industry serves a wide range of other industrial sectors including:

automotive	electronics
medical equipment	printed circuit boards
aerospace and defense	furniture
tools and dies	jewelry
marine hardware	household appliances
oil field equipment	construction hardware

Metal finishing is performed in two ways: as a captive operation or department of manufacturing company, and on a job-shop basis where the work is performed under contract for the owner of the product, article or material that is to be finished. According to the Bureau of the Census, there were just under 3300 job-shop electroplaters in business in 1985, with nationwide employment totaling approximately 71,000. By November 1987, the nationwide employment was 77,000.

Chicago
Washington

The job-shop metal finishing industry can be characterized as a small business industry in every respect. Most metal finishing firms are family owned businesses, with a large percentage of minority employment. The Bureau of the Census reported that in 1985:

- 26% of SIC 3471 establishments employed between 1 and 4 persons
- 20 % employed 5-9;
- 22% employed 10-19;
- 22% employed 20-49;
- 7% employed 50-99;
- 3% employed 100-249;
- the remainder, less than 1% over 250.

Approximately 90% of the 3300 job shops in the United States employed fewer than 50 people, while 68% employed fewer than 20. Annual sales for the typical job shop are approximately \$1.25 million. Because the industry is dominated by small job shops there are no major producers with large shares of the market.

The above figures illustrate why the metal finishing industry has a direct and on-going interest in the legislative deliberations regarding clean air and air toxics specifically. Our members have limited resources with which to deal with new or expanded environmental regulation and law.

The metal finishing industry is currently one of the most highly regulated small business sectors. NAMF members comply with Clean Water Act discharge standards, RCRA hazardous waste disposal regulations, SARA Title III reporting requirements, Hazardous Communication Standards, and OSHA regulations for workplace environments and occupational safety. This last requirement, OSHA has resulted in large investments in air emission and management equipment.

The industry has had recent experience with newly mandated controls for chrome 6 in southern California. In addition to the rulemaking process which has resulted in the expenditure of significant sums, industry members estimate that the total installation by installation equipment bill alone will range from \$150,000 to \$500,000 per shop. This does not include the cost of stack monitoring procedures which are costing \$6,000 to \$10,000 per test.

The process in southern California also raises the question of the efficacy of toxic regulations. Well into the regulatory process, data became available which indicated that the largest amount of chrome in the ambient atmosphere is the tri-valent form, non-toxic and non-carcinogenic. Add this to data that indicates that less than 3% of all toxic pollution is generated from industrial sources other than refining and power generation and you have a regulatory process which has resulted in significant financial burdens to small businesses with a very small return in environmental safety.

NAMF supports amendment of the Clean Air Act to control emissions of air toxics and provide an additional margin of safety. The following are several points that the small business, metal finishing industry feels are necessary for an environmentally effective and economically sound law.

* Full credit for early voluntary emissions. As noted above the metal finishing industry has installed an operates significant air emissions control

equipment. The resulting emissions control should be recognized in the form of credits for early compliance in any legislation passed. This credit should include reductions made either less than or greater than 90% of total pre-control emissions. Credits limited to only those with reductions greater than 90% fail to create an incentive for early incremental control.

* Creation and funding of the Small Generator Technology Assistance Program. The industry supports the creation of a small generator assistance program in the form now incorporated in HR. 3030. As noted above, this industry has had to shoulder the burden of developing emission control technology in response to other federal statutes and several local regulatory initiatives. The industry's experience with the associated costs illustrates the serious impact possible on small businesses.

* The list of regulated pollutants should draw distinctions between those that are truly toxic or carcinogenic and those with acute or chronic effects. Selection of regulated pollutants should be made with the use of data such as that described above for southern California which established significantly lower pollution percentages and risks after complete information was available.

Thank you for the opportunity to present some of the concerns of a small business industry. The National Association of Metal Finishers expects to participate in the on-going deliberations regarding Clean Air Amendments and looks forward to adoption of legislation that addresses both clean air and small business implementation issues.

COMMENTS ON S.816
TOXICS RELEASE PREVENTION
ACT OF 1989

SUBMITTED BY
THE SCREEN PRINTING ASSOCIATION INTERNATIONAL
10015 MAIN STREET, FAIRFAX, VIRGINIA 22031

SENATE ENVIRONMENTAL PROTECTION SUBCOMMITTEE
OF THE SENATE ENVIRONMENT AND PUBLIC WORKS COMMITTEE
WASHINGTON, D.C.

The Screen Printing Association International (SPAI), the professional trade association for the screen printing industry and associated supplier base, appreciates the opportunity to submit comments on S. 816, the Toxics Release Prevention Act of 1989.

The screen printing industry is composed of over 40,000 facilities which are involved in many areas of production from signs and soda bottles to mass transit and electronics. Specific types of screen printing include decal manufacturing, container decorating, circuitry printing, textile printing, industrial and close tolerance printing, heat applied graphics, point-of-purchase advertising, specialty advertising and outdoor advertising. Screen printers produce such diverse items as greeting cards, ceramics, banners, nameplates, fleet markings, signs and instrumentation. Most of these facilities are family-operated small businesses. They average only fifteen employees, and are located primarily in urban areas.

Screen printing is very different from other printing processes such as flexography, gravure or offset lithography. The screen printing process is the only commercial and industrial printing technique that can transfer words and images directly onto virtually any surface. The principle is not hard to understand. A very fine screen is stretched tightly on a frame. Part of the screen is blocked with a stencil, leaving open mesh areas defining the image. Wet ink is deposited over the screen, and the ink is transferred to the surface, or substrate, below resulting in a printed image.

The machinery for screen printing is also unlike that for other printing methods, both in capability and design. The machines hold the screen and lowers it over the substrate. A squeegee is used to transfer the ink from the screen to the substrate. The printed product is then fed through a dryer system. The screen itself can be cleaned with a solvent and reclaimed for use on another project. Throughout this printing process, volatile organic compounds (VOC) and, to a limited extent, toxic air pollutants may be emitted.

We are concerned with the ability of small quantity generators to understand and comply with the requirements set forth in S. 816 as it contains language which is oftentimes confusing and misleading for smaller sources. This legislation will impact the screen printing industry, and there are many contradictory statements and requirements which will only make compliance more difficult for the individual small business. We do not dismiss the fact that area sources need to control their air pollutants; however, we do strongly believe that the current system which focuses on the development of control strategies and state compliance efforts does not help small quantity generators, only hinders them.

The screen printing industry perfectly illustrates the problem that arises when the focus is on compliance strategies. This industry sector is considered a small quantity generator, and because of the use of inks and solvents this industry generates volatile organic compounds and, to a lesser extent, air toxics. In developing control strategies for the screen printing industry, states are reviewing the control technical guidelines currently available. None of the current guidelines address

screen printing as an industry sector. Thus, states are choosing and utilizing control strategies that do not fit the industry thus forcing the industry to comply with requirements which are totally infeasible.

As an example, the State of New York recently amended its air pollution control regulations to include screen printing facilities. Instead of creating control strategies appropriate to the screen printing industry, the state opted to regulate screen printing as a surface coating operation. Surface coating operations are large, roll-to-roll, continuous coating facilities. The operation is different, the equipment is different, and the requirements -- proposed by EPA in the early seventies -- do not reflect either current or advanced technology in the screen printing industry.

If our industry is to be regulated for both volatiles and air toxics, then strategies which truly reflect industry practices must be developed. We are willing to help, but the impetus needs to begin with the Environmental Protection Agency. Many states will not deviate from technical guidelines currently available, which puts many small quantity generators at a disadvantage.

Failing EPA's development of appropriate industry guidelines, the states should be able to assist the small quantity generator in developing cost-effective control strategies. The control requirements listed in the technical guidelines are geared towards large businesses, and are not readily transferable to smaller companies. Small companies lack the technical staff to develop an effective air pollution control program, and often lack the resources to implement it.

SPAI supports the inclusion of language offering small quantity generators technical assistance in controlling toxic and volatile organic compound emissions. An amendment included in the House Clean Air Act amendments establishes such an assistance program, including education and information programs promoting compliance. This approach is a necessary component to any air pollution control legislation if we are to expect small quantity generators to reduce the amount of pollutants emitted.

We commend you for the amount of attention paid to the area source category in your legislation, but it needs to go further in recognizing the problems associated with the control of air pollutants by small businesses. As a member of the Clean Air Working Group, the Screen Printing Association International is committed to developing strategies which will allow businesses to continue to grow while effectively controlling the level of pollutants emitted. We recognize our responsibility to the environment.

We look forward to working with the Committee in developing a comprehensive piece of legislation that is fair to everyone.

SIERRA
CLUB



MIDWEST OFFICE

214 N. Henry St., Suite 203, Madison, Wisconsin 53703 (608) 257-4994

Comments prepared by Jane Elder
Sierra Club Midwest Representative
and
Federal Great Lakes Policy Project Director
for the
U.S. Senate
Subcommittee on Environmental Pollution
Committee on Environment and Public Works
on the
Toxics Release Prevention Act of 1989
September 21, 1989

The Sierra Club Great Lakes Federal Policy Project sincerely appreciates this opportunity to comment on behalf of the Sierra Club's half million members, over 100,000 of whom live in the Great Lakes states and Ontario. There is a pressing need for Congress to move quickly and decisively in enacting a new comprehensive program for controlling toxic air pollution. Simply put, no issue is more critical to the future of the Great Lakes or the citizens of the region than finding a way to stop the toxic rain. We need a comprehensive solution to the air toxics problem, with specific protection for the Great Lakes.

THE GREAT LAKES: A HUGE TOXICS DEPOSITORY

In the Great Lakes region, we not only breathe toxic air pollution in our cities, but we drink it in our water and eat it in our fish. I love the Great Lakes, as millions do. I grew up in Michigan knowing the joys of a summer's day on a Lake Superior shore, and the sweet taste of Mom's white fish and lake trout dinners. But I no longer eat Great Lakes fish, and I hope no women my age who yet hope to have children do.

Throughout the Great Lakes region the fish are contaminated with PCBs, DDT, aldrin, dieldrin, dioxin, toxaphene, and heavy metals, including mercury.

Every Great Lakes state and the province of Ontario issue human consumption advisories (see attachment 1, Wisconsin Fish Consumption Advisories from 1989 and 1985) which are designed to help the consumer determine which fish are safe and which fish are too contaminated to eat. Some of the advisories even cover waterfowl species which are hunted in the Great Lakes region. Many of the chemicals found in these fish and ducks accumulate in living tissue, and are associated with reproductive and developmental effects as well as cancer. (See attachment 2, matrix showing toxicological effects in Great Lakes animals.) Thus, women of childbearing age and children receive more cautious advisories than mature males.

The determined Great Lakes angler could attempt to sort his or her way through the advisories by size, species, body-fat content, and the other variables to attempt a safe meal, but the fact that the advisories have to exist at all is a tragic statement on the state of the Great Lakes.

I am still astounded that the public agencies charged with protecting the Great Lakes and public health accept and tolerate this level of contamination in our fish. It is unacceptable, and the only way we will ever have safe fish again is to stop the toxics from getting into the lakes in the first place. And the only way to stop the toxic inputs is to go to the major uncontrolled source: the air.

There is no unpolluted place left in the Great Lakes. No safe haven to "get away from it all." The atmosphere has served as the great equalizer, sharing industrial and urban pollution with our most remote wilderness shorelines. Even Lake Superior, which we sentimentally call "pristine", is contaminated to the extent that large lake trout are unsafe for women and children to eat. (Source: Michigan, Minnesota and Wisconsin Fish advisories.)

NOTE: Attachments to this statement have been retained in committee files.

The last of the wild top aquatic predators in the Great Lakes system--the Lake Superior lake trout--are contaminated, and the source of this contamination is by and large not the effluent of Duluth's sewers or Thunder Bay's pulp mill discharge; it is the sky.

Over the last twenty years we have as a nation, spent billions on cleaning up sewage and industrial discharge in the Great Lakes. We still have a long way to go, but we have made progress. However, we could stop every point source discharge of pollution into the Great Lakes system and still not have tackled half the problem.

The International Joint Commission's Workshop on Great Lakes Atmospheric Deposition, consisting of a team from the IJC Science Advisory Board, Water Quality Board, and International Air Quality Advisory Board, published a Summary Report in October of 1987. The report tells us that 90% or more of three of the most serious toxic pollutants -- PCB's, lead, Benzo(a)pyrene -- found in Lake Superior are coming from the air. For Lakes Michigan and Huron the figure is 50% or higher. Because of the significant contributions of remaining point sources, the percentages are lower for Lakes Erie and Ontario and the St. Lawrence River.

The lower Great Lakes system also receives the accumulated downstream contributions from atmospheric deposition in the upper lakes. (See attachment 3, Atmospheric loadings of PCBs, BaP and lead into the Great Lakes. Figures for lead have been corrected since original publication of the Summary Report based on conversations with Dr. Richard Liroff, a contributing scientist to the report. The correct figures appear in our chart.) By the time the waters reach the Gulf of St. Lawrence, they are sufficiently polluted to threaten the viability of the beluga whale populations that once thrived in the gulf. (See attachment 4, IJC Report on Water Quality Appendix B, statement on beluga whales.)

What goes up goes somewhere. Nearly all of it comes down. Until we can stop toxic contaminants from washing out in rain and snow, as well as dry fallout, we will never have safe fish or a healthy ecosystem in the Great Lakes.

The Isle Royale data reinforces this assumption. The fish in the inland lakes of this wilderness island in the far reaches of Lake Superior are contaminated--even more so than those in the waters of the surrounding lake because of the short food chain and the small dilution capacity of rain-fed lakes. (Swain, 1978, Swain, 1982), (Swackhamer, Hites, 1987, 1988 data.) The only source for the PCBs, HCB, octochlorostyrene and other chemicals found in their flesh is the contribution from rain, snow and dry fallout reaching the island. When even the fish in pristine wilderness areas are tainted with pollutants we know we have a very serious ecological problem.

Isle Royale also illustrates the distances these contaminants can travel. When toxaphene was discovered in Isle Royale's Siskiwit Lake (Swain, 1980) the scientific world was astounded. This chemical was used almost exclusively in the south as a boll weevil pesticide on cotton crops and as a mite control in western stock yards. Toxaphene, like many chlorinated organic compounds is very persistent in the environment. Although banned in 1982 because of its

carcinogenic properties, remaining stockpiles could be used until 1987 for a variety of purposes.

At this year's 32nd International Association of Great Lakes Research Conference a paper was presented documenting contamination in lakes as far north as the high arctic in Canada's Northwest territories--some contaminant levels were comparable to those found in Lake Superior. (See Attachment 5, abstract of study.) So, the Great Lakes aren't the only hosts to airborne toxics. Like DDT, we just found out about it in the lakes first.

ENVIRONMENTAL EXPOSURES AND CONCENTRATIONS

What are these contaminants doing to our ecosystem? First of course, the fish are contaminated. Dr. John Black of Roswell Park Memorial Institute--a cancer research center--testified before the House Committee on Merchant Marine and Fisheries in 1983:

"An extreme example [of bioaccumulation] is the case of the Great Lakes. The relative importance of the fish versus drinking water in this situation can be a little better appreciated if one considers that given a fish contaminated with PCB at 5ppm, a human would have to drink Great Lakes water for about 1,000 years in order to equal the amount of PCB that you get in a single one pound serving of these contaminated fish."

The efficiencies of the food chain are astounding when it comes to accumulating persistent toxic chemicals. (See attachment 6, table showing food web concentrations in Lake Ontario.) Those that accumulate in fatty tissue in fish and wildlife also accumulate in fatty tissue in humans. In a 1987 article in Aquatic Toxicology, "Human Health Consequences of Consumption of Fish Contaminated with Organochlorine Compounds," Dr. Swain states:

"Transplacental transmission of the contaminant (PCB) was confirmed, along with subsequent exposure of infants, both in utero and postpartum, via maternal milk."

Chemicals capable of crossing the placenta in pregnant women, and of concentrating in breast milk provide obvious incentive for the special cautions for women of childbearing age in fish advisories. Apparently one of the few ways a woman can reduce her body burden of lipophilic contaminants is by having a baby and nursing it, thus passing a portion of the concentrations on to her child--a fate no mother or child should be subjected to.

The significance of bioaccumulation is that the same chemicals that bioaccumulate in fish also bioaccumulate in humans. Moreover, we are also inhaling them. Standards to protect the environment, as well as human health, are critical to any long-term toxic pollution control strategy. Until our regulatory programs recognize the potential for persistent chemicals to accumulate in the ecosystem we will be saddled with an ineffective dilution-based approach, and neither human health nor the environment will be protected.

As mentioned earlier, in the Great Lakes region we receive multiple exposures from pollutants originally introduced into the environment from the atmosphere. We breathe toxic air pollutants, we drink them in our Great Lakes water, and we eat them in our fish and wildlife. Our risks are compounded by these multiple exposures. In the 1985 report The Great Lakes Water Quality Agreement: An Evolving Instrument for Ecosystem Management, the Royal Society of Canada and the U.S. National Research Council went so far as to state that there is:

"...substantial evidence that the human population living in the Great Lakes basin is exposed to, and accumulates, appreciably more toxic chemical burden than people living in similarly large regions of North America for which data are available."

The most exposed populations are at highest risk. After receiving a Sea Grant study on risk assessment, a Wisconsin newspaper ran this headline: "Eating Great Lakes Fish No Worse Than Breathing Urban Air". I find no comfort in that statement. Tragically, the most exposed tend to be the urban poor. For many of them, locally caught fish is not a recreational pursuit--it is a major component of their food supply. They also have little choice but to breathe the air around them.

In January 1989 EPA published the first draft of its "Estimation and Evaluation of Cancer Risks Attributed to Air Pollution in Southeast Chicago." According to the study,

"...the average risk across the area due to air pollution as estimated by this study is approximately 2.2×10^{-4} , or about 2 chances in 10,000.

"This study focused on air pollution risks and did not evaluate risks from other forms of exposure to environmental contamination. Other exposure routes include exposure through drinking water, skin contact, eating fish or swimming in lakes (e.g. Wolf Lake) which may contain contaminants, and exposure to indoor air contaminants including radon...Air pollution appears to be an important cause of environmental pollution-related cancer cases in this area..."

Protecting human health requires looking at the broadest exposure pathways. Effective legislation should require the EPA Administrator to consider cumulative and synergistic effects in assessing whether an air pollutant has serious adverse effects to human health. This is an essential requirement to protect people who are subjected to a multiple pathway assault from a variety of toxics.

ENVIRONMENTAL AND HEALTH EFFECTS ARE SERIOUS

PCBs and chlorinated hydrocarbons have been associated with reproductive and developmental impairments in both wildlife and humans. The high incidence of birth defects such as the cross-billed syndrome as well as egg failure and "wasting" in cormorants and Caspian terns is linked with these chemicals. (Ludwig, et al, 1987, 1988 and previous work) (Kubiak, 1988) (Geisy, Tillet, 1988). Recent research conducted by the Fish and Wildlife Service links a specific PCB isomer with the failure of lake trout reproduction. (See attachment 7, IJC Focus article on Dr. Mac's findings.) The one long-term study on humans exposed to Great Lakes PCBs suggests lingering learning disabilities in children associated with high consumption levels of Great Lakes fish. (Jacobson, 1983, 1984, 1985)

Some persistent chemicals do not bioaccumulate but are instead easily metabolized by living organisms and do damage in different ways. Alkylated lead is a good example of a chemical that is easily distributed through the blood stream. It affects the reproductive, nervous, and kidney systems. Children are particularly vulnerable to exposure to lead, which leads to decreased learning ability and other damage. Lead is a chemical for which we already have ambient standards. IJC data (See attachment 3) estimates that 543,000 kilograms per year enter Lake Michigan--99.5% of that total from the air.

Benzo(a)pyrene is a chemical in the PAH or POM family which has been directly linked with cancer in Great Lakes fish. It is also a human carcinogen. The same IJC study attributes 80% of the Benzo(a)pyrene found in Lake Huron, roughly 290 kilograms per year, to atmospheric sources.

Mercury is a chemical which is causing serious concern throughout the Great Lakes region. Again, here we have a chemical which is, in theory, regulated under section 112 of the Clean Air Act. Yet this January, Michigan issued fish advisories for all of its inland lakes because of mercury contamination, and similar advisories exist in northern Minnesota, Wisconsin and Ontario.

Michigan explained in its advisory (attachment 8)...

"Michigan's inland lakes probably receive mercury from a combination of atmospheric deposition and naturally occurring source with atmospheric deposition likely making a more significant contribution in the Lower Peninsula than in the Upper Peninsula.

"How does mercury get into fish?

"Whether naturally occurring or from human activities, mercury attaches to small sediment particles and settles to the lake or river bed where microorganisms convert a portion of it to the organic or methylmercury form. Methylmercury is rapidly absorbed by a fish either directly from the water passing over its gills or ingested with the organisms which form its diet."

While some mercury exists naturally in soils and bedrock, a significant portion of this inland lake contamination is coming from the air. Rain and

snow samples in northern Minnesota over the last year showed that some samples actually exceeded EPA's own water quality criteria. (Minnesota Pollution Control Agency: Assessment of Mercury Toxicity in Selected Minnesota Lakes and Streams, January 1989, draft.) When even the rain is in violation of water quality criteria, we have compelling evidence of the extent of the environmental problem.

REGULATORY ACTION URGENTLY NEEDED

We could wait for the evidence to build--more deformed birds, less and less wild lake trout, eagles and beluga whales, more children with developmental and learning disabilities, more complicated fish advisories, more cancers--but what more do we need to know? We already know these chemicals are toxic--that's why we regulate them under the Clean Water Act, RCRA, and Superfund and why they are listed as toxic chemicals by the IJC. We already know many are found in the Great Lakes in sufficient quantities to affect the viability of the fish and wildlife, and we already know that significant quantities of them are coming from the atmosphere.

If we wait to regulate until we find conclusive evidence that a specific dioxin molecule from a specific pulp mill caused a birth defect in a specific child, it will be far too late. It is already too late for many of us who would rather not grapple with how many fish we ate growing up and the unknown impact on the next generation. It appears it is already too late to sustain wild lake trout in the lower lakes. It is too late for the deformed birds, and perhaps the beluga whales.

The Great Lakes are a remarkably resilient ecosystem, but only on their timetable. It takes 191 years for Lake Superior to replace its water supply--99 years for Lake Michigan. (IJC data.) Future generations are certain to be plagued by our generation's pollution. We know that lake contaminants reach humans. Thus, the fish advisories. The question remains as to when we will have safe fish again.

The current regulatory approach for air toxics has failed the Great Lakes. The United States regulates only seven chemicals under section 112. Some 1,000 toxic chemicals have been found in the Great Lakes. Many of these chemicals have a gaseous, vapor or fine-particle state which allows them to be distributed in the atmosphere. Of all of these chemicals, 11 have been identified as "Primary Track Critical Pollutants" by the IJC.

- Total polychlorinated biphenyls (PCB)
- DDT and metabolites
- Dieldrin
- Toxaphene
- 2,3,7,8, -tetrachlorodibenzo-p-dioxin (2,3,7,8,-TCDD)
- 2,3,7,8, -tetrachlorodibenzofuran (2,3,7,8,-TCDF)
- Mirex
- Mercury
- Alkylated Lead
- Benzo(a)pyrene
- Hexachlorobenzene

According to the IJC 1987 Report on Great Lakes Water Quality:

"Ten of the 11 Critical Pollutants (mirex excepted) are present in the air. Atmospheric transport and deposition into the Great Lakes basin, either directly onto the water surface or indirectly onto the drainage basin with subsequent transport, have been clearly demonstrated. Even though the magnitude of the input (relative to other sources and pathways) has not been fully defined, the available evidence indicates that atmospheric deposition is a major pathway for contamination of the Great Lakes ecosystem." Since the 1987 report was published, mirex was also found in Lake Superior. (Sergeant, Munawar, Hodson, 1989)

A significant improvement in the way the Clean Air Act regulates air toxics is urgently needed. We can no longer wait decades for lengthy studies to determine that a chemical we know is toxic in other media also damages human lungs. We must move ahead with installing the best technology available for all the major sources that emit a significant list of chemicals which are well documented toxins. This step alone will significantly reduce exposure in industrial and urban areas, and will also reduce the atmospheric loadings which contribute to Great Lakes pollution.

The list of chemicals for control should address all the critical pollutants in the Great Lakes (See attachment 9), as well as other chemicals of concern in the Basin such as cadmium. I would urge the committee to review one particular list of chemicals to make sure that a key group is included in the regulatory strategy. Among the chlorinated hydrocarbons are those with structures similar to dioxin. These "dioxin equivalents" are increasingly linked with reproductive damage, mortality in embryos and cancer.

We need legislation that clearly recognizes the link between aquatic damage and air pollution, and that requires the EPA to prevent further damage from occurring. This specific mandate is needed in an agency which is reluctant to assert authority in new areas.

Moreover, legislation should further U.S. efforts in fulfilling our obligations to Canada under the Water Quality Agreement. In 1987 both nations pledged to adopt controls to eliminate the sources of emissions of persistent toxic substances which contribute to pollution of the Great Lakes System.

"The parties, in cooperation with State and Provincial Governments, shall develop, adopt and implement measures for the control of the sources of emissions of toxic substances and the elimination of the sources of emissions of persistent toxic substances in cases where atmospheric deposition of these substances, singly or in synergistic or additive combination with other substances, significantly contributes to pollution of the Great Lakes system."

--Revised Great Lakes Water Quality Agreement of 1976 as amended by Protocol signed November 18, 1987

Finally, it is essential to protect public health. For chemicals which do not readily break down and/or bioaccumulate, ambient air standards are not doing

the job. The authority to require tougher standards for chemicals for which we receive secondary exposures should be spelled out in no uncertain terms. By protecting the entire Great Lakes ecosystem from airborne toxics, we also protect ourselves.

The groundwork for further scientific assessment is already in place. Data collection from a variety of sources in the Great Lakes continues, and every year the evidence becomes more compelling. By the end of the summer we expect a new Region V EPA study on emissions data far beyond Right-to-Know statistics for 58 toxic chemicals in the Lake Michigan basin, and we have urged EPA to expand this study for the entire Great Lakes watershed.

We applaud the initiative shown by the committee in developing air toxics legislation, and hope that the final product will provide the best available technology standards and health protection for those of us who receive a "double dose of toxics" from the air we breathe and the food we eat. Thank you for the opportunity to comment.

References

- Glass, G.E., J.A. Sorenson, G.R. Rapp, JR., 1989. Assessment of mercury toxicity in selected Minnesota lakes and streams. A progress report to the Minnesota Pollution Control Agency. pp.9
- Jacobson, J.L., G.G. Fien, S.W. Jacobson, P.M. Schwartz and J.K. Dowler, 1984a. The transfer of polychlorinated biphenyls (PCBs) and polybrominated biphenyls (PBBs) across the human placenta and into maternal milk. *Am. J. Public Health* 74, 378-379.
- Jacobson, J.L., S.W. Jacobson, P.M. Schwartz, G.G. Fein and J.K. Dowler, 1984b. Parental exposure to an environmental toxin: a test of the multiple effects model. *Dev. Psychol.* 20, 523-532.
- Jacobson, S.W., G.G. Fein, J.L. Jacobson, P.M. Schwartz, and J.K. Dowler, 1985. The effects of intrauterine PCB exposure on visual recognition memory. *Child Dev.* 56, 853-860.
- Jacobson, S.W., J.L. Jacobson, P.M. Schwartz and G.G. Fein, 1983. Intrauterine exposure of human newborns to PCBs: measures of exposure. In: *PCBs: human and environmental hazards*, edited by F.M. D'itri and M.A. Kamrin, Butterworth Pub., Boston, Ma. pp. 311-343.
- Kubiak, T.J., 1988. Diffuse Toxic Pollutants in the Great Lakes Ecosystem. Hearing before the Subcommittee on Investigations and Oversight of the Committee on Public Works and Transportation, U.S. House of Representatives. One Hundredth Congress. Second Session (April 14, 1988). pp. 43-46, 77-80.
- Ludwig, J.P., H. Kurita, M.E. Ludwig, 1987. Results of the 1987 Michigan Colonial Waterbird Monitoring Project on Caspian Terns and Double-Crested Cormorants: egg incubation and field studies of colony productivity, embryologic mortality and deformities. *Ecological Research Services, Inc.* Sept. 30.
- Ludwig, J.P., H. Kurita and T. Kubiak, 1988. Description and rates of occurrence of abnormalities in Double-Crested Cormorant and Caspian Tern embryos from Michigan colonies of the Great Lakes: a summary of 1987-88 field observations on dead eggs. *Ecological Research Services Inc.* Dec. 15.
- EPA, 1989. Estimation and evaluation of cancer risks attributed to air pollution in southeast Chicago. A report by the EPA Region 5, Air and Radiation Division. Chicago, Il. January.
- Sergeant, Munawar and Hodson, 1989 Identification of Mirex in Lakes Erie, Huron and Superior. Paper presented at the 32nd Annual Conference on Great Lakes Research

Swackhamer, D. L., and Hites, R. A., 1988. Occurrence and Bioaccumulation of Organochlorine Compounds in Fishs from Siskiwit Lake, Isle Royale, Lake Superior. In Environmental Science and Technology, Volume 22, page 543.

Swain, W.R., 1978. Chlorinated organic residues in fish, water, and precipitation from the vicinity of Isle Royale, Lake Superior. J. Great Lakes Res. 4, 398-407.

Swain, W.R., 1980. Chlorinated organic residue in fish, water, and precipitation from the vicinity of Isle Royale, Lake Superior. J. Greta Lakes Res. 4(3-4): 398-407.

Swain, W.R., M.D. Mullin and J.C.Filkins, 1982. Refined analysis of residue forming organic substances in lake trout from the vicinity of Isle Royale, Lake Superior. Presented at the 25th IAGLR Conference on Great Lakes Research, Sault Ste. Marie, May 4-6.

101ST CONGRESS
1ST SESSION

S. 816

To control the release of toxic air pollutants, to reduce the threat of catastrophic chemical accidents, and for other purposes.

IN THE SENATE OF THE UNITED STATES

APRIL 18 (legislative day, JANUARY 3), 1989

Mr. DURENBERGER (for himself, Mr. LAUTENBERG, Mr. BREAUX, Mr. BAUCUS, Mr. CHAFEE, Mr. BURDICK, Mr. MITCHELL, Mr. MOYNIHAN, Mr. WARNER, Mr. GRAHAM, Mr. JEFFORDS, and Mr. LIEBERMAN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

To control the release of toxic air pollutants, to reduce the threat of catastrophic chemical accidents, and for other purposes.

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

3 SECTION. 1. This Act may be cited as the "Toxics Re-
4 lease Prevention Act of 1989".

5 SEC. 2. Section 112 of the Clean Air Act is amended to
6 read as follows:

7 "HAZARDOUS AIR POLLUTANTS

8 "SEC. 112. (a) DEFINITIONS.—

1 “(1) The term ‘major source’ means any station-
2 ary source (including all emission points and units of
3 such source located within a contiguous area and under
4 common control) of air pollutants that emits consider-
5 ing installed and operating controls, in the aggregate,
6 ten metric tons per year or more of any hazardous air
7 pollutant or twenty-five metric tons per year or more
8 of any combination of hazardous air pollutants. The
9 Administrator may establish a lesser quantity, or in the
10 case of radionuclides different criteria, for a major
11 source than that specified in the previous sentence, on
12 the basis of the potency of the air pollutant, other
13 characteristics of the air pollutant, or other relevant
14 factors.

15 “(2) The term ‘area source’ means any stationary
16 or mobile source of hazardous air pollutants that is not
17 a major source.

18 “(3) The term ‘stationary source’ means any facil-
19 ity or installation or unit of such facility or installation
20 which emits or may emit any hazardous air pollutant.

21 “(4) The term ‘new source’ means a source the
22 construction of which is commenced after the Adminis-
23 trator first proposes regulations under this section es-
24 tablishing emissions standards applicable to such
25 source.

1 “(5) The term ‘hazardous air pollutant’ means any
2 air pollutant listed pursuant to subsection (b).

3 “(6) For purposes of this section, the term ‘ad-
4 verse environmental effects’ means any threat of signif-
5 icant adverse effects, which may reasonably be antici-
6 pated, to wildlife, aquatic life, or other natural re-
7 sources including disruption of local ecosystems, im-
8 pacts on populations of endangered or threatened spe-
9 cies, significant degradation of environmental quality
10 over broad areas, or other comparable effects.

11 “(7) The terms ‘owner or operator’ and ‘existing
12 source’ shall have the same meaning as such terms
13 have under section 111(a).

14 “(b) LIST OF POLLUTANTS.—

15 “(1) Not later than three months after the date of
16 enactment of the Toxics Release Prevention Act of
17 1989, the Administrator shall publish a list of air pol-
18 lutants to which the provisions of this section shall
19 apply and which shall include each of the air pollutants
20 on the list of the air pollutants contained in committee
21 print 101-XX published by the Committee on Envi-
22 ronment and Public Works of the United States Senate
23 and entitled “Air Pollutants Subject to Section 112 of
24 the Clean Air Act”.

1 “(2) The Administrator shall, from time to time,
2 but not less often than every five years, review and
3 revise the list established by paragraph (1) adding pol-
4 lutants which present, or may present, a threat of ad-
5 verse human health effects (including, but not limited
6 to, substances which are known to be, or may reason-
7 ably be anticipated to be, carcinogenic, mutagenic, ter-
8 atogenic, neurotoxic, which cause reproductive dys-
9 function, or which are acutely or chronically toxic but
10 not including effects for which a pollutant has been
11 listed pursuant to section 108 of this Act) or adverse
12 environmental effects whether through ambient concen-
13 trations, bioaccumulation, deposition, or otherwise, but
14 not including releases subject to regulation under sec-
15 tion 129 as a result of emissions to the air. No sub-
16 stance, practice, process, or activity regulated under
17 part B of this Act shall be subject to regulation under
18 this section solely due to its adverse effects on the
19 environment.

20 “(3)(A) Any person may petition the Administra-
21 tor to modify the list established by paragraph (1) by
22 adding or deleting a substance. Within twelve months
23 after receipt of a petition the Administrator shall either
24 grant the petition or publish a statement of the reasons
25 for not granting the petition. The Administrator may

1 not deny a petition on the basis of inadequate resources
2 or time for review.

3 “(B) The Administrator shall add a substance to
4 the list upon a showing by the petitioner or on the Ad-
5 ministrator’s own determination that the substance is
6 an air pollutant and that emissions or ambient concen-
7 trations of the substance are known to cause or may
8 reasonably be anticipated to cause adverse effects to
9 human health or adverse environmental effects, or that
10 the substance is an air pollutant that qualifies for addi-
11 tion to the list established under section 313 of the
12 Emergency Planning and Community Right-to-Know
13 Act of 1986.

14 “(C) The Administrator shall remove a substance
15 from the list upon a showing by the petitioner or on
16 the Administrator’s own determination that there is
17 adequate data on the health and environmental effects
18 of the substance to determine that emissions or ambi-
19 ent concentrations of the substance may not reasonably
20 be anticipated to cause any adverse effects to the
21 human health or adverse environmental effects, or that
22 the substance qualifies for deletion from the list estab-
23 lished under section 313 of the Emergency Planning
24 and Community Right-to-Know Act of 1986. Action
25 by the Administrator pursuant to section 313(d)(3) of

6

1 such Act prior to the date of enactment of this para-
2 graph shall constitute a deletion for the purposes of
3 this section.

4 “(4) If the Administrator determines that informa-
5 tion on the health or environmental effects of a sub-
6 stance is not sufficient to make a determination re-
7 quired by this subsection, the Administrator may use
8 the authorities of section 104(i) of the Comprehensive
9 Environmental Response, Compensation and Liability
10 Act and other information-gathering authorities under
11 such Act and other laws administered by the Agency
12 to acquire such information.

13 “(5) The Administrator may establish test meas-
14 ures and other analytic procedures for monitoring and
15 measuring emissions and ambient concentrations of
16 hazardous air pollutants.

17 “(c) LIST OF SOURCE CATEGORIES.—

18 “(1) Not later than twelve months after the date
19 of enactment of the Toxics Release Prevention Act of
20 1989 and after notice and opportunity for public com-
21 ment, the Administrator shall publish (and from time to
22 time revise) a list including all categories and subcate-
23 gories of major sources of hazardous air pollutants
24 which shall, to the extent practicable, be consistent

1 with the list of source categories established pursuant
2 to section 111 and part C of this Act.

3 “(2) The Administrator shall list under this sub-
4 section and designate for regulation under subsection
5 (d) each category or subcategory of area sources which
6 the Administrator finds presents a threat of adverse ef-
7 fects to human health or the environment (by such
8 sources individually or in the aggregate) warranting
9 regulation under this section.

10 “(3) In addition to those categories and subcate-
11 gories of sources designated for regulation pursuant to
12 paragraphs (1) and (2), the Administrator may at any
13 time designate additional categories and subcategories
14 of sources of hazardous air pollutants according to the
15 same criteria for designation applicable under such
16 paragraphs and at the time of designation shall estab-
17 lish a date for the promulgation of emissions standards
18 under subsection (d).

19 “(4) At the time of setting a standard for any cat-
20 egory or subcategory of sources pursuant to subsection
21 (d), (f), or (g), the Administrator shall also establish a
22 minimum emissions rate for each hazardous air pollut-
23 ant emitted by sources in the category or subcategory
24 reflecting the criteria for listing a hazardous air pollut-
25 ant established by subsection (b)(2). All sources in the

1 category or subcategory emitting more than the mini-
2 mum emissions rate for any hazardous air pollutant
3 shall be subject to standards promulgated under sub-
4 section (d), (f), or (g). In no event shall the minimum
5 emissions rate be greater than ten metric tons per year
6 for any one hazardous air pollutant or twenty-five
7 metric tons per year for any combination of such
8 pollutants.

9 “(5) Notwithstanding the provisions of paragraph
10 (4), the Administrator may establish a minimum emis-
11 sions rate of more than ten metric tons for a category
12 or subcategory and a pollutant for which a health ef-
13 fects threshold can be established, provided that, the
14 minimum emissions rate assures, with an ample margin
15 of safety, such threshold will not be exceeded within
16 the vicinity of the sources in the category and that no
17 adverse environmental effects will occur as the result
18 of emissions from the sources individually or in combi-
19 nation with emissions from other similar sources.

20 “(d) EMISSIONS STANDARDS.—

21 “(1) The Administrator shall promulgate emis-
22 sions standards for every category or subcategory of
23 sources of hazardous air pollutants designated for regu-
24 lation pursuant to subsection (c).

1 “(2) Emissions standards promulgated under this
2 subsection and applicable to new or existing sources of
3 hazardous air pollutants shall require the maximum
4 degree of reduction in emissions of each air pollutant
5 subject to this section (including a prohibition on such
6 emissions, where achievable) that the Administrator,
7 taking into consideration the cost of achieving such
8 emissions reduction, and any non-air-quality health and
9 environmental impacts and energy requirements, deter-
10 mines is achievable for new or existing sources in the
11 category or subcategory to which such emissions stand-
12 ard applies, through application of measures, processes,
13 methods, systems or techniques including, but not lim-
14 ited to, measures which—

15 “(A) reduce the volume of such pollutants
16 through process changes, substitution of materials,
17 or other modifications,

18 “(B) enclose systems or processes to elimi-
19 nate emissions,

20 “(C) collect, capture, or treat such pollutants
21 when released from a process, stack, storage, or
22 fugitive emissions point,

23 “(D) are design, equipment, work practice,
24 or operational standards, or

25 “(E) are a combination of the above.

1 “(3) The degree of reduction in emissions that is
2 deemed achievable for new sources in a category or
3 subcategory shall not be less stringent than the most
4 stringent emissions level that is achieved in practice by
5 a source in the same category or subcategory, as deter-
6 mined by the Administrator, and may be more strin-
7 gent where feasible. Emissions standards under this
8 subsection for existing sources in a category or sub-
9 category may be less stringent than standards for new
10 sources in a similar category or subcategory, if the Ad-
11 ministrator determines that the level of control applica-
12 ble to new sources is generally technically or economi-
13 cally infeasible for existing sources in the category or
14 subcategory and, considering, sequentially, the level of
15 control achieved by existing sources in the category or
16 subcategory beginning with the most stringent such
17 level, establishes an emissions limitation which is gen-
18 erally feasible and assures the maximum total reduction
19 in emissions from all sources in the category or sub-
20 category. The Congress finds that a reduction of 90
21 per centum from uncontrolled levels is an appropriate
22 benchmark for emissions standards applicable to exist-
23 ing sources under this subsection.

24 “(4) With respect to pollutants for which a health
25 threshold can be established, the Administrator may

1 consider such threshold level with an ample margin of
2 safety, when establishing emissions standards under
3 this subsection.

4 “(5) With respect only to categories and subcate-
5 gories of area sources listed pursuant to subsection
6 (c)(2), the Administrator is authorized, in addition to
7 the authorities provided in paragraph (2) and subsec-
8 tions (f) and (g), to promulgate standards or require-
9 ments applicable to sources in such categories or sub-
10 categories which provide for the use of cost-effective
11 and generally available control technologies or man-
12 agement practices by such sources to reduce emissions
13 of hazardous air pollutants.

14 “(6) The Administrator shall review, and revise as
15 necessary (taking into account developments in prac-
16 tices, processes, and control technologies), emissions
17 standards promulgated under this section no less often
18 than every seven years.

19 “(7) No emissions standard or other requirement
20 promulgated under this section shall be interpreted,
21 construed or applied to diminish or replace the require-
22 ments of a more stringent emission limitation or other
23 applicable requirement established pursuant to section
24 111, part C, section 172(b) (3) or (6), or other author-

1 ity of this Act or a standard issued under State author-
2 ity.

3 “(8) Emissions standards promulgated under this
4 subsection shall be effective upon promulgation.

5 “(e) SCHEDULE FOR STANDARDS AND REVIEW.—

6 “(1) The Administrator shall promulgate regula-
7 tions establishing emissions standards for categories
8 and subcategories of sources designated for regulation
9 pursuant to subsection (c) as expeditiously as practica-
10 ble, assuring that—

11 “(A) emissions standards for categories or
12 subcategories of sources of acrylonitrile, benzene,
13 butadiene, cadmium, carbon tetrachloride, chloro-
14 form, ethylene dichloride, ethylene oxide, methyl-
15 ene chloride, perchloroethylene, trichloroethylene,
16 and coke oven emissions are promulgated not
17 later than twenty-four months after the date of
18 enactment of this subsection;

19 “(B) emissions standards for 25 per centum
20 of the categories and subcategories designated
21 pursuant to subsection (c) (1) and (2) shall be pro-
22 mulgated not later than three years after such
23 date;

24 “(C) emissions standards for 50 per centum
25 of the categories or subcategories designated pur-

1 suant to subsection (c) (1) and (2) shall be promul-
2 gated not later than five years after such date;
3 and

4 "(D) emissions standards for all categories
5 and subcategories designated for regulation pursu-
6 ant to subsection (c) (1) and (2) shall be promul-
7 gated not later than ten years after such date.

8 "(2) In determining priorities for scheduling the
9 promulgation of standards pursuant to subparagraphs
10 (1) (B), (C) and (D), the Administrator shall consider—

11 "(A) the known or anticipated adverse effects
12 of such pollutants on human health and the
13 environment;

14 "(B) exposure to and the location of major
15 sources of such pollutants including risks to indi-
16 viduals most exposed and the consequent urgency
17 of a national standard;

18 "(C) the quantity of hazardous air pollutants
19 that sources in each category or subcategory emit;
20 and

21 "(D) the efficiency of grouping the categories
22 or subcategories according to the pollutants emit-
23 ted or the processes or technologies used.

24 "(3) Not later than twenty-four months after the
25 date of enactment of this subsection and after opportu-

1 nity for comment, the Administrator shall publish a
2 schedule establishing a date for the promulgation of
3 emissions standards for each category and subcategory
4 of sources listed pursuant to subsection (c) (1) and (2)
5 which shall be consistent with the requirements of
6 paragraphs (1) and (2). The determination of priorities
7 for the promulgation of standards pursuant to this
8 paragraph is not a rulemaking and shall not be subject
9 to judicial review, except that, failure to promulgate
10 any standard pursuant to the schedule established by
11 this paragraph shall be subject to review under section
12 307 of this Act.

13 “(4) If, under other provisions of this Act, the
14 Administrator is proposing or promulgating require-
15 ments applicable to a class of sources similar to a cate-
16 gory or subcategory listed pursuant to this section, the
17 Administrator may simultaneously propose or promul-
18 gate emissions standards under this section for such
19 category or subcategory notwithstanding the priorities
20 established by paragraph (2). Nothing in this paragraph
21 shall be construed or applied to stay a deadline for
22 control requirements otherwise applicable under this or
23 other law.

24 “(5)(A) Not later than three years after the initial
25 promulgation of emissions standards for a category or

1 subcategory of sources pursuant to subsection (d), the
2 Administrator shall commence an evaluation of the
3 risks to human health and the environment resulting
4 from emissions of hazardous air pollutants by sources
5 in the category or subcategory remaining after applica-
6 tion of such standards. If the Administrator finds as
7 the result such evaluation, that emissions of hazardous
8 air pollutants from sources in the category or subcate-
9 gory (or portion thereof), individually or in the aggre-
10 gate, after application of the prescribed standards,
11 present a significant risk of adverse effects on public
12 -- health or a threat of adverse environmental effects, the
13 Administrator shall complete, within two years after
14 the date of commencement, such evaluation and revise
15 standards applicable to such category or subcategory
16 (or portion thereof) using the authorities of subsection
17 (f) or (g), as appropriate.

18 “(B) The Administrator shall take such steps as
19 are necessary, including studies pursuant to section
20 104(i) of the Comprehensive Environmental Response,
21 Compensation and Liability Act, to assure that ade-
22 quate data on the health and environmental effects of
23 any hazardous air pollutant emitted by sources in a
24 category or subcategory subject to review under this

1 paragraph are available at the commencement of the
2 evaluation.

3 “(C) To the extent that standards promulgated
4 under subsection (d) do not eliminate lifetime risks of
5 carcinogenic effects greater than one in one million to
6 the individual in the population who is most exposed to
7 emissions of a pollutant (or stream of pollutants) from a
8 source in the category or subcategory (as determined
9 according to Guidelines for Carcinogenic Risk Assess-
10 ment published by the Administrator), the Administra-
11 tor shall use the authorities of subsection (f) to revise
12 the standards applicable to such pollutant (or stream of
13 pollutants) and categories or subcategories. To the
14 extent that standards promulgated under subsection (d)
15 do not reduce emissions to a level at or below the
16 threshold for adverse health effects, with an adequate
17 margin of safety, for pollutants other than carcinogens,
18 the Administrator shall use the authorities of subsec-
19 tion (g) to revise the standards applicable to such pol-
20 lutants and categories or subcategories. With respect
21 to any hazardous air pollutant which is both a carcino-
22 gen and causes adverse health effects for which a
23 threshold exists, the Administrator shall establish
24 standards pursuant to subsection (f) for sources of such
25 pollutant, unless a more stringent standard than would

1 be promulgated pursuant to subsection (f)(1)(A) is nec-
2 essary to assure that such threshold, with an ample
3 margin of safety, will not be exceeded. The Adminis-
4 trator shall in any such case establish a standard under
5 subsection (g) in lieu of the standard which would be
6 applicable under (f)(1)(A).

7 “(f) ADDITIONAL REGULATION OF CARCINOGENS.—

8 “(1) The Administrator is authorized to promul-
9 gate emissions standards under this subsection applica-
10 ble to categories or subcategories of sources of any
11 hazardous air pollutant which is a known, probable, or
12 possible human carcinogen. For each such pollutant (or
13 stream of pollutants containing carcinogens) the Ad-
14 ministrator shall establish two simultaneously applica-
15 ble standards including—

16 “(A) a standard which eliminates all lifetime
17 risks of carcinogenic effects greater than one in
18 ten thousand to the individual in the population
19 who is most exposed to emissions of a pollutant
20 (or stream of pollutants) from a source in the cat-
21 egory or subcategory; and

22 “(B) a standard which eliminates all lifetime
23 risks of carcinogenic effects greater than one in
24 one million to the individual in the population who
25 is most exposed to emissions of a pollutant (or

1 stream of pollutants) from a source in the cate-
2 gory or subcategory.

3 No consideration of cost, cost effectiveness, economic,
4 energy, or other factors or technological feasibility
5 shall be included in the determination of the appropri-
6 ate level of any emissions standard under this
7 subsection.

8 “(2) Any standards promulgated under this
9 subsection shall be effective upon the date of
10 promulgation.

11 “(g) STANDARDS TO PROTECT HEALTH AND THE
12 ENVIRONMENT.—

13 “(1) The Administrator is authorized to promul-
14 gate emissions standards under this subsection applica-
15 ble to categories or subcategories of sources of any
16 hazardous air pollutant which is not a carcinogen. The
17 Administrator shall establish any emission standard or
18 standards under this subsection at the level which, in
19 the judgment of the Administrator, provides an ample
20 margin of safety to protect the public health, unless a
21 more stringent standard is required to protect the envi-
22 ronment. No consideration of costs, cost effectiveness,
23 economic, energy, or other factors or technological fea-
24 sibility shall be included in the determination of the ap-
25 propriate level of any emission standard or the margin

1 of safety to protect the public health under this
2 subsection.

3 “(2) Any emission standard established pursuant
4 to this subsection shall become effective upon pro-
5 mulgation.

6 “(h) WORK PRACTICE STANDARDS AND OTHER RE-
7 QUIREMENTS.—

8 “(1)(A) In addition to any numerical emissions
9 limitation established under this section, the Adminis-
10 trator is authorized to promulgate a design, equipment,
11 work practice, or operational standard, or combination
12 thereof, applicable to sources in categories or subcate-
13 gories listed pursuant to subsection (c) and consistent
14 with the provisions of subsection (d), (f), or (g). The
15 Administrator shall promulgate such standards when-
16 ever it is not feasible to prescribe or enforce an emis-
17 sion standard for a category or subcategory for control
18 of hazardous air pollutants (or a stream of such pollut-
19 ants). In the event the Administrator promulgates a
20 design or equipment standard under this paragraph, the
21 Administrator shall include as part of such standard
22 such requirements as will assure the proper operation
23 and maintenance of any such element of design or
24 equipment.

1 “(B) For the purpose of this paragraph, the
2 phrase ‘not feasible to prescribe or enforce an emission
3 standard’ means any situation in which the Administra-
4 tor determines that (i) a pollutant (or stream of pollut-
5 ants) listed pursuant to subsection (b) cannot be emit-
6 ted through a conveyance designed and constructed to
7 emit or capture such pollutant, or that any requirement
8 for, or use of, such a conveyance would be inconsistent
9 with any Federal, State, or local law, or (ii) the appli-
10 cation of measurement methodology to a particular cat-
11 egory or subcategory of sources is not practicable due
12 to technological and economic limitations.

13 “(C) If after notice and opportunity for public
14 hearing, any person establishes to the satisfaction of
15 the administrator that an alternative means of emission
16 limitation will achieve a reduction in emissions of any
17 air pollutant (or stream of pollutants) at least equiva-
18 lent to the reduction in emissions of such pollutant
19 achieved under the requirements of subparagraph (A),
20 the Administrator shall permit the use of such alterna-
21 tive by the source for purposes of compliance with this
22 section with respect to such pollutant.

23 “(D) Any standard promulgated under subsections
24 (d), (f), or (g) shall include a numerical emissions limi-

1 tation whenever it is feasible to promulgate and en-
2 force a standard in such terms.

3 “(2) For the purposes of developing or assisting in
4 the development of any standard, requirement, or regu-
5 lation, conducting any study, or enforcing the provi-
6 sions of this section, the Administrator (or a State with
7 an approved program under subsection (1)) may require
8 the owner or operator of any facility which emits air
9 pollutants subject to this section or stores any sub-
10 stance subject to section 129 of this act to monitor for
11 the presence of such pollutant in the emissions (both
12 point and nonpoint) from such source and in the ambi-
13 ent air within the vicinity of the facility, to install and
14 maintain leak detection systems, and to keep records
15 and make reports on the results of such monitoring and
16 leak detection.

17 “(3)(A) Emissions standards promulgated pursuant
18 to this section shall include, where appropriate, leak
19 prevention, detection and correction requirements con-
20 sistent with the provisions of subsection (d)(2) and may
21 include monitoring, recordkeeping, reporting, vapor re-
22 covery, secondary containment, or other requirements,
23 which shall be applicable to devices and systems (in-
24 cluding pumps, compressors, valves, flanges, connec-

tors, containers, and vessels) from which there may be emissions of any pollutant subject to this section.

“(B) Regulations under this paragraph may require the owner or operator of a source to carry out an annual audit and safety inspection to locate and correct all leaks and other preventable routine or episodic releases of any air pollutant subject to this section. The results of such inspection and the results of any other safety inspection, survey, or audit carried out with respect to the source shall be available to the Administrator, to the State in which the source is located, and to the public, consistent with the provisions of sections 322, 323, and 324 of the Emergency Planning and Community Right-to-Know Act of 1986.

“(4) Any design, equipment, work practice, or operational standard, audit or monitoring requirement or any combination thereof, described in this subsection shall be treated as an emission standard for purposes of the provisions of this Act (other than the provisions of this subsection).

“(i) SCHEDULE FOR COMPLIANCE.—

“(1) After the effective date of any emissions standard under this section, no air pollutant may be emitted from any source in violation of an emissions standard under this section, except in the case of an

1 existing source, the Administrator shall establish a
2 compliance date or dates for each category or subcate-
3 gory of existing sources, which shall provide for com-
4 pliance as expeditiously as practicable, but in no event
5 later than three years after the effective date of such
6 standard, except as provided in paragraphs (2) through
7 (7).

8 “(2) With respect to standards established pursu-
9 ant to subsection (f)(1)(A), the Administrator (or a
10 State acting pursuant to a program approved under
11 subsection (1)) may grant an extension permitting an
12 existing source a period of up to five additional years
13 to comply with such standard, if the Administrator (or
14 the State) determines, based on specific information
15 submitted by the owner or operator of the source and
16 other available information, that—

17 “(A) the owner or operator would experience
18 extraordinary economic hardship in compliance
19 with such standard and requires that such source
20 or category of sources comply with the emissions
21 limitation promulgated pursuant to subsection (d);
22 and

23 “(B) during the period of the extension emis-
24 sions, limitations applicable to the source shall

1 assure that the health of persons will be protected
2 from any imminent and substantial endangerment.

3 Compliance with standards promulgated pursuant to
4 subsection (f)(1)(A) shall not be stayed during the pend-
5 ency of any judicial proceeding to review a determina-
6 tion made under this paragraph.

7 “(3)(A) With respect to standards promulgated
8 pursuant to subsection (f)(1)(B) the Administrator (or a
9 State acting pursuant to a program approved under
10 subsection (1)) may grant an existing source a tempo-
11 rary exception from the standard, if the Administrator
12 (or the State) determines, based on specific information
13 provided by the owner or operator of the source and
14 other information, that the standard cannot be achieved
15 by the source using all available technology and oper-
16 ational controls and that the source will implement a
17 risk-reduction program employing all such technology
18 and controls. For purposes of this subparagraph the
19 phrase ‘all available technology and operational con-
20 trols’ shall include all measures which are technically
21 feasible including process modifications and materials
22 substitution to reduce emissions of hazardous air pollut-
23 ants from the source. The Administrator (or the State)
24 may require the owner or operator of the source to
25 conduct research and development on improved or

1 more effective control technologies or management
2 practices as a condition for any temporary exception or
3 permit renewal pursuant to this paragraph.

4 “(B) Any request for an exception under this
5 paragraph shall be submitted within six months of the
6 date of promulgation of the applicable standard and
7 shall include all information necessary for the Adminis-
8 trator (or the State) to make a determination with re-
9 spect to the eligibility of a source for an exception. The
10 Administrator (or the State) shall review and approve
11 or disapprove any request within one year of submittal.
12 Any request failing to meet the requirements of this
13 subparagraph shall be deemed denied.

14 “(C) An exception may only be granted under this
15 paragraph, if the Administrator (or the State) has pro-
16 vided notice of the proposed exception and has provid-
17 ed an opportunity for public comment and a public
18 hearing on the conditions of the proposed exception.
19 The Administrator may review, on appeal by any
20 person or on the Administrator’s own motion, and re-
21 verse any exception granted by a State under this
22 paragraph. The Administrator shall make a determina-
23 tion with respect to any appeal within one hundred and
24 eighty days.

1 “(D) An exception granted under this section shall
2 be reviewed upon renewal of the permit for the source,
3 and may be extended after a further determination sub-
4 ject to the same terms and conditions as applicable in
5 the first instance.

6 “(4) The President may exempt any source from
7 compliance with paragraph (1) for a period of not more
8 than two years if the President finds that the technol-
9 ogy to implement such standards is not available and
10 the operation of such source is required for reasons of
11 national security. An exemption under this paragraph
12 may be extended for one or more additional periods,
13 each period not to exceed two years. The President
14 shall make a report to Congress with respect to each
15 exemption (or extension thereof) made under this
16 paragraph.

17 “(5)(A) The Administrator may exempt any exist-
18 ing source from an emissions standard promulgated
19 pursuant to subsection (d) upon a showing by the
20 owner or operator of such source that it has achieved a
21 voluntary reduction of 90 per centum or more in emis-
22 sions of hazardous air pollutants from the source on or
23 before December 31, 1992.

24 “(B) The reduction shall be determined with re-
25 spect to verifiable and actual emissions in a base year

1 not earlier than calendar year 1985, provided that,
2 there is no evidence that emissions in the base year are
3 artificially or substantially greater than emissions in
4 other years prior to implementation of emissions reduc-
5 tion measures.

6 “(C) For each source granted an exemption under
7 this paragraph there shall be established by a permit
8 issued pursuant to subsection (j) an enforceable emis-
9 sions limitation for hazardous air pollutants reflecting
10 the reduction which qualifies the source for an exemp-
11 tion under this paragraph. An exemption under this
12 paragraph shall not include an exemption from stand-
13 ards or requirements promulgated pursuant to subsec-
14 tion (f) or (g) and the Administrator shall review emis-
15 sions from sources granted exemptions under this para-
16 graph according to the provisions of subsection (e)(5) at
17 the same time that other sources in the category or
18 subcategory are reviewed.

19 “(D) For purposes of this paragraph, the term
20 ‘voluntary’ means not otherwise required by a Federal,
21 State, or local air pollution control law or regulation.

22 “(E) The Administrator shall promulgate regula-
23 tions to carry out the provisions of this paragraph as
24 expeditiously as practicable, but not later than twelve
25 months after the date of enactment of the Toxics Re-

1 lease Prevention Act of 1989. Such regulations may
2 include fees sufficient to offset the costs of reviewing
3 applications for exemptions submitted under this para-
4 graph. Revenues from such fees received by the Ad-
5 ministrator shall, notwithstanding the provisions of the
6 Miscellaneous Receipts Act, be used for the purpose of
7 administering this section.

8 “(F) With respect to pollutants for which high
9 risks of adverse human health effects may be associat-
10 ed with exposure to small quantities including, but not
11 limited to, chlorinated dioxins and furans, the Adminis-
12 trator shall by regulation limit the use of offsetting re-
13 ductions in emissions of other hazardous air pollutants
14 from the source as counting toward the 90 per centum
15 reduction in such high-risk pollutants qualifying for an
16 exemption under this paragraph.

17 “(6) Notwithstanding the requirements of this sec-
18 tion, no existing source that has installed—

19 “(A) reasonably available control technology,

20 “(B) best available control technology (as de-
21 fined in section 169(3)),

22 “(C) technology required to meet a lowest
23 achievable emissions rate, or

24 “(D) or has voluntarily achieved (as certified
25 to the Administrator) on or after January 1,

1 1993, a reduction of 90 per centum in the emis-
2 sions of the hazardous air pollutants emitted by
3 the source,
4 prior to the promulgation of a standard under this sec-
5 tion applicable to such source and the same pollutant
6 (or stream of pollutants) controlled pursuant to an
7 action described in subparagraph (A), (B), (C), or (D)
8 shall be required to comply with such standard under
9 this section until the date five years after the date on
10 which such installation or reduction has been achieved,
11 as determined by the Administrator. The Administrator
12 may issue such rules and guidance as are necessary to
13 implement this paragraph.

14 “(7)(A) If at any source a hazardous air pollutant
15 is subject to regulation under this section because the
16 source emits more than the minimum emissions rate of
17 other pollutants, the Administrator (of a State acting
18 pursuant to a program approved under subsection (1))
19 may, at the request of the owner or operator of the
20 source, waive the requirements applicable to such pol-
21 lutant where emissions of the pollutant are in de mini-
22 mis amounts and do not present a significant risk of
23 adverse effects to human health or adverse environ-
24 mental effects and control of the pollutant would re-

1 quire installation of additional and separate control
2 technologies for that pollutant only.

3 “(B) Applications for waivers under this section
4 shall be submitted not later than four months after the
5 effective date of the relevant standard and the Admin-
6 istrator (or the State) shall make a determination on
7 any application within six months of submission. Appli-
8 cations which are not complete shall be deemed denied
9 without further opportunity for reapplication. An appli-
10 cation for a waiver under this paragraph shall not stay
11 the applicant’s obligation to comply with emissions
12 standards applicable to other pollutants. Applications
13 shall be accompanied by fees adequate to offset all
14 direct and indirect costs of reviewing such applications.
15 Not later than eighteen months after the date of enact-
16 ment of this paragraph, the administrator shall publish
17 guidance on procedures for application and review.

18 “(j) PERMIT PROGRAM.—

19 “(1) Except as provided in paragraph (2) and after
20 the date of enactment of this section, it shall be unlaw-
21 ful for any person to construct a new source, or for the
22 owner or operator of any source to emit any air pollut-
23 ant, subject to any emissions standard under this sec-
24 tion, except in compliance with a permit issued by the
25 Administrator (or a State acting pursuant to a program

1 approved under subsection (1)) under this subsection.
2 The Administrator shall promulgate within twelve
3 months after the date of enactment of this subsection
4 regulations establishing the minimum elements of a
5 permit program. These elements shall include—

6 “(A) requirements for permit applications, in-
7 cluding a standard application form and fees suffi-
8 cient to offset the direct and indirect cost of proc-
9 essing applications;

10 “(B) monitoring and reporting requirements;

11 “(C) a requirement that permittees pay an
12 annual fee sufficient to offset all direct and indi-
13 rect costs of administering the program (if such
14 fees are paid to the Administrator, the Adminis-
15 trator may, notwithstanding any requirement of
16 the Miscellaneous Receipts Act, expend such re-
17 cepts for the purposes of administering the provi-
18 sions of this section); and

19 “(D) a requirement that any State seeking
20 approval of a program pursuant to subsection (1)
21 have adequate personnel and funding to adminis-
22 ter the program and adequate authority to—

23 “(i) issue permits that apply, and assure
24 compliance by all sources within the State

1 with, each applicable standard, regulation or
2 requirement under this section;

3 “(ii) issue permits for a fixed term, not
4 to exceed five years;

5 “(iii) terminate or modify permits for
6 cause, including establishment of a new
7 emissions standard applicable to the source;

8 “(iv) enforce permits and the require-
9 ment to obtain a permit, including adequate
10 civil and criminal penalties;

11 “(v) provide public notice of each appli-
12 cation for a permit and an opportunity for
13 public hearing before a determination on
14 each such application; and

15 “(vi) ensure that no permit will be
16 issued if the Administrator timely objects to
17 its issuance.

18 No fee schedule established by the Administrator under
19 this subsection shall be designed with the purpose of
20 supporting other aspects of any State air pollution con-
21 trol program including elements for control of area
22 sources or prevention of accidents. Nothing in this sub-
23 section shall prevent a State from imposing additional
24 permit fees, except that, the Administrator shall not
25 approve any program pursuant to subsection (1), if rev-

1 enues from such fees are used for purposes other than
2 the development and implementation of programs to
3 control the emissions of hazardous air pollutants. When
4 issuing permits in the absence of an approved State
5 program, the Administrator shall comply with the
6 guidelines issued to implement this paragraph.

7 “(2)(A) Notwithstanding the requirements of para-
8 graph (1), a source in a category or subcategory sub-
9 ject to an emissions standard under this section may
10 commence (in the case of a new source) or continue (in
11 the case of an existing source) operations prior to the
12 issuance of a permit, provided that, the owner or oper-
13 ator of the source certifies to the Administrator (or to
14 the State) that the source will comply with all applica-
15 ble standards and requirements under this section. Cer-
16 tification pursuant to this paragraph shall be provided
17 for new sources before operations commence and for
18 existing sources six months after the effective date of
19 any applicable standard or revision of a standard under
20 this section. The certification shall be accompanied by
21 a compliance plan describing means by which the
22 source intends to achieve the standard on and after the
23 compliance date established by subsection (i) and shall
24 be signed by a responsible official of the business con-
25 cern owning or operating the source.

1 “(B) Upon receipt of any certification, the Admin-
2 istrator (or the State) shall issue a temporary operating
3 permit for the source, unless within thirty days the Ad-
4 ministrator (or the State) notifies the owner or operator
5 of the source that the certification does not adequately
6 demonstrate compliance with all applicable standards
7 and requirements under this section. Any temporary
8 permit issued under this paragraph shall be enforceable
9 to the same extent as any standard or other require-
10 ment promulgated under this section.

11 “(C) Within six months of the issuance of any
12 temporary operating permit for any source under this
13 paragraph, the Administrator (or the State) shall com-
14 mence a review of the operations of such source, in-
15 cluding an inspection at the site of the source, to deter-
16 mine whether a full operating permit under this subsec-
17 tion should be issued. If upon conclusion of such
18 review (including any right to administrative appeal,
19 but not including pendency of any judicial proceeding),
20 the Administrator (or the State) determines that a
21 permit should not be issued, the temporary permit
22 granted under this paragraph shall be suspended
23 immediately.

24 “(D) The owner or operator of each source re-
25 ceiving a temporary permit under this subsection shall

1 recertify annually as to its compliance with all stand-
2 ards or requirements applicable to such source under
3 this section. The Administrator may require emissions
4 monitoring and reporting as a condition of recertifica-
5 tion. The Administrator shall require that certifications
6 (including any annual recertifications) under this para-
7 graph be accompanied by a fee sufficient to offset the
8 full administrative costs of reviewing certifications.

9 “(3)(A) In the event that the Administrator fails
10 to promulgate a standard for a category or subcategory
11 of sources by the date established pursuant to subsec-
12 tion (e) (1)(A) or (3), and beginning six months after
13 such date, it shall be unlawful for the owner or opera-
14 tor of any source in such category or subcategory to
15 emit any hazardous air pollutant except in compliance
16 with a permit issued by the Administrator (or a State
17 acting pursuant to a program approved under subsec-
18 tion (1)) under this paragraph.

19 “(B) The permit shall be issued pursuant to the
20 provisions of paragraph (1) and such other provisions
21 as are necessary to carry out the objectives of this Act.
22 In preparing applications for permits under this para-
23 graph, the owner or operator of the source shall
24 commit to the installation and operation of technology
25 and practices to control emissions of hazardous air pol-

1 lutants which are the best technology and practices
2 available for such source, as certified by an independ-
3 ent, registered professional engineer.

4 “(C) Each permit issued under this paragraph
5 shall include an enforceable emission limitation for each
6 hazardous air pollutant emitted by the source and no
7 such pollutant may be emitted in amounts exceeding
8 the applicable limitation immediately for new sources
9 and, as expeditiously as practicable, but not later than
10 the date three years after the permit is issued for exist-
11 ing sources.

12 “(D) If the Administrator subsequently promul-
13 gates a standard which would be applicable in lieu of
14 the emissions limitations established by permit under
15 this section, the Administrator (or the State) shall
16 revise such permit upon the next renewal to reflect the
17 standards promulgated by the Administrator.

18 “(E) Paragraph (2) shall not be available to any
19 source requiring a permit under this paragraph.

20 “(4) The Administrator shall suspend the issuance
21 of permits by the Agency in any State promptly upon
22 approval of a program for that State under subsection
23 (1).

24 “(5)(A) Each State shall transmit to the Adminis-
25 trator a copy of each permit application (but not in-

1 cluding certifications for temporary permits) and includ-
2 ing any application for an extension or modification
3 submitted under this section, and shall provide for
4 notice of each permit proposed to be issued by the
5 State.

6 “(B) No permit shall issue if the Administrator
7 within sixty days objects in writing to its issuance as
8 not in compliance with the requirements of this section.
9 The Administrator shall provide with the objection a
10 statement of the reasons for the objection and the
11 terms and conditions that the Administrator would
12 impose if the permit were issued by the Administrator.

13 “(C) If the State fails within ninety days after the
14 date of the objection to submit a permit revised to
15 meet the objection, the Administrator shall have au-
16 thority to issue or deny the permit.

17 “(D) Nothing in this paragraph shall be interpret-
18 ed, construed, or applied to require the Administrator
19 to review each permit to be issued by a State, provided
20 that the Administrator conducts an audit program
21 which assures that State permitting activities are con-
22 sistent with the goals and objectives of this section.

23 “(6) To the maximum extent practicable, permits
24 issued under this section shall be consolidated with
25 other permits required under this Act.

1 “(k) AREA SOURCE PROGRAM.—

2 “(1) The Congress finds that emissions of hazard-
3 ous air pollutants from area sources may individually,
4 or in the aggregate, present significant risks to public
5 health in urban areas. It is the purpose of this subsec-
6 tion to achieve a substantial reduction in emissions of
7 hazardous air pollutants from area sources and an
8 equivalent reduction in the public health risks associat-
9 ed with such sources. Considering the large number of
10 persons exposed and the risks of carcinogenic and other
11 adverse health effects from hazardous air pollutants,
12 ambient concentrations characteristic of large urban
13 areas should be reduced to levels substantially below
14 those currently experienced.

15 “(2) The Administrator shall, after consultation
16 with State and local air pollution control officials, con-
17 duct a program of research with respect to sources of
18 urban pollution and shall include within such
19 program—

20 “(A) ambient monitoring for a broad range of
21 hazardous air pollutants (including, but not limited
22 to, volatile organic compounds, metals, pesticides
23 and products of incomplete combustion) in a rep-
24 resentative number of urban locations;

1 “(B) analysis to characterize the sources of
2 such pollution with a focus on area sources and
3 the contribution that such sources make to public
4 health risks from hazardous air pollutants; and

5 “(C) consideration of atmospheric transfor-
6 mation and other factors which can elevate public
7 health risks from such pollutants.

8 Health effects considered under this program shall in-
9 clude, but not be limited to, carcinogenicity, mutage-
10 nicity, teratogenicity, neurotoxicity, reproductive dys-
11 function, and other acute and chronic effects including,
12 but not limited to, the role of such pollutants as pre-
13 cursors of ozone or acid aerosol formation. The Admin-
14 istrator shall report the preliminary results of such re-
15 search not later than three years after the date of en-
16 actment of this paragraph.

17 “(3) The Governor of each State receiving a grant
18 under section 105 of this Act and containing a metro-
19 politan statistical area, with a population exceeding
20 two hundred and fifty thousand persons shall com-
21 mence, not later than eighteen months after the date of
22 enactment of this subsection, a monitoring program in
23 each such area to detect and measure the ambient con-
24 centration of hazardous pollutants in the air. The Ad-
25 ministrator shall, after consultation with the States,

1 prescribe a list of hazardous air pollutants and detec-
2 tion methods (including frequency and location) for pur-
3 poses of this paragraph which shall reflect those pollut-
4 ants likely to be emitted by area sources in metropoli-
5 tan areas and which present the greatest risk to public
6 health. To the extent practicable, monitoring under this
7 paragraph shall be conducted at various times of the
8 day and seasonally and at a variety of locations within
9 each metropolitan area. The Governor shall prepare a
10 biennial report on the results of the monitoring pro-
11 gram which shall be made available to the public at a
12 hearing within the metropolitan area and which shall
13 be transmitted to the Administrator. The report shall
14 identify sources or categories of sources contributing to
15 the presence of hazardous pollutants in the air and
16 shall quantify the risks to public health. The Adminis-
17 trator may promulgate such regulations as are neces-
18 sary to carry out this paragraph, including provisions
19 which—

20 “(A) phase in the monitoring program over a
21 longer period, but not to exceed three years;

22 “(B) provide for a reduction in the frequency
23 of monitoring in areas which have detected low
24 ambient concentrations or health risks in previous
25 monitoring cycles; and

1 “(C) which extend the monitoring program to
2 other areas.

3 “(4) Taking into account the information devel-
4 oped through the monitoring programs authorized by
5 paragraphs (2) and (3), the Administrator shall, not
6 later than five years after the date of enactment of this
7 subsection and after notice and opportunity for public
8 comment, prepare and transmit to the Congress a com-
9 prehensive strategy to control hazardous air pollutants
10 released by area sources in urban areas. The strategy
11 shall include a schedule of specific actions to substan-
12 tially reduce the public health risks posed by the re-
13 lease of hazardous air pollutants from area sources
14 which will be implemented by the Administrator under
15 the authority of this or other laws or by the States.
16 The strategy shall identify particular pollutants and
17 area source categories or subcategories which present
18 public health threats, those specific actions to reduce
19 emissions which will be taken with respect to the iden-
20 tified pollutants and categories, the authorities (wheth-
21 er under this Act or other laws including, but not lim-
22 ited to, the Toxic Substances Control Act, the Federal
23 Insecticide, Fungicide, and Rodenticide Act, and the
24 Resource Conservation and Recovery Act, adminis-
25 tered by the Agency) which will be relied upon to

1 achieve reductions and a schedule for implementing the
2 proposed actions. The strategy may also identify re-
3 search needs in monitoring, analytical methodology,
4 modeling or pollution control techniques and recom-
5 mendations for changes in law that would further the
6 goals and objectives of the strategy. In selecting pollut-
7 ants and categories or subcategories of area sources for
8 control under the strategy, the Administrator shall con-
9 sider those pollutants and sources that present the
10 highest risks to public health in the largest number of
11 communities. Nothing in this subsection shall be inter-
12 preted to preclude or delay implementation of actions
13 with respect to area sources of hazardous air pollutants
14 under consideration pursuant to this or any other law
15 and which may be promulgated before the strategy is
16 prepared. The Administrator shall implement the strat-
17 egy as expeditiously as practicable.

18 “(5) In addition to the national urban air toxics
19 strategy authorized by paragraph (4), the Administra-
20 tor shall also encourage and support areawide strate-
21 gies developed by State or local air pollution control
22 agencies which are intended to reduce risks from emis-
23 sions by areas sources within a particular urban area.
24 From the funds available for grants under this section,
25 the Administrator shall set aside not less than 10 per

centum to support areawide strategies addressing hazardous air pollutants emitted by area sources and shall award such funds on a demonstration basis to those States with innovative and effective strategies. At the request of State or local air pollution control officials, the Administrator shall prepare guidelines for control technologies or management practices which may be applicable to various categories or subcategories of area sources.

“(6) The Administrator shall report to the Congress at intervals not later than eight and ten years after the date of enactment of this subsection on actions taken under this subsection and other parts of this Act to reduce the risk to public health posed by the release of hazardous air pollutants from area sources. The reports shall also identify specific metropolitan areas which continue to experience high risk to public health as the result of emissions from area sources.

“(7) The Administrator of the Environmental Protection Agency shall prepared a report with recommendations on health impacts of mobile source benzene emissions considering both fuel and vehicle-based control strategies to be submitted to the Environment and Public Works Committee of the Senate and the Energy

1 and Commerce Committee of the House of Representa-
2 tives not later than twenty-four months after the date
3 of the enactment of the Toxics Release Prevention Act
4 of 1989.

5 “(1) STATE PROGRAMS.—

6 “(1) Each State may develop and submit to the
7 Administrator for approval a program for the imple-
8 mentation and enforcement (including a review of en-
9 forcement delegations previously granted) of emission
10 standards and other requirements for air pollutants sub-
11 ject to this section or requirements for the prevention
12 and mitigation of sudden, accidental releases pursuant
13 to section 129. A program submitted by a State under
14 this subsection may provide for partial or complete del-
15 egation of the Administrator’s authorities and responsi-
16 bilities to implement and enforce emissions standards
17 and prevention requirements but shall not include au-
18 thority to set standards less stringent than those pro-
19 mulgated by the Administrator under this Act.

20 “(2) Not later than twelve months after the date
21 of enactment of this paragraph, the administrator shall
22 publish guidance which would be useful to the States
23 in developing programs for submittal under this subsec-
24 tion. Guidance shall, at a minimum, include permitting
25 requirements for new and existing sources of air pollut-

1 ants subject to this section. The guidance shall also
2 provide for the registration of all facilities producing,
3 processing, handling, or storing any substance listed
4 pursuant to section 129 in amounts greater than the
5 threshold quantity. The Administrator shall include as
6 an element in such guidance an optional program for
7 the review of high-risk point sources of air pollutants
8 including, but not limited to, hazardous air pollutants
9 listed pursuant to subsection (b).

10 “(3) The Administrator shall establish and main-
11 tain an air toxics clearinghouse, control technology
12 center, and risk information center to provide technical
13 assistance and information to the States on measures,
14 methods, practices and techniques effective in reducing
15 the emissions of air pollutants subject to this section or
16 section 129.

17 “(4) Upon application of a State, the Administra-
18 tor may make grants, subject to such terms and condi-
19 tions as the Administrator deems appropriate, to such
20 State for the purpose of assisting the State in develop-
21 ing and implementing a program for submittal and ap-
22 proval under this subsection. Programs assisted under
23 this paragraph may include program elements address-
24 ing air pollutants other than those specifically subject
25 to this section or section 129. Grants under this para-

1 graph may include support for high-risk point source
2 review as provided in paragraph (2) and support for the
3 development and implementation of areawide area
4 source programs pursuant to subsection (k).

5 “(5) Not later than one hundred and eighty days
6 after receiving a program submitted by a State, and
7 after notice and opportunity for public comment, the
8 Administrator shall either approve or disapprove such
9 program. The Administrator shall disapprove any pro-
10 gram submitted by a State, if the Administrator deter-
11 mines that—

12 “(A) the authorities contained in the program
13 (including conditions in permits) are not adequate
14 to assure compliance by all sources within the
15 State with each applicable standard, regulation, or
16 requirement establish by the Administrator under
17 this section;

18 “(B) adequate authority does not exist, or
19 adequate resources (including revenues from
20 permit fees) are not available, to implement the
21 program;

22 “(C) the schedule for implementing the pro-
23 gram (including the schedule for issuing permits)
24 and assuring compliance by affected sources is not
25 sufficiently expeditious; or

1 “(D) the program is otherwise not in compli-
2 ance with the guidance issued by the Administra-
3 tor under paragraph (2) or is not likely to satisfy,
4 in whole or in part, the objectives of this Act.

5 If the Administrator disapproves a State program, the
6 Administrator shall notify the State of any revisions or
7 modifications necessary to obtain approval. The State
8 may revise and resubmit the proposed program for
9 review and approval pursuant to the provisions of this
10 subsection.

11 “(6) Whenever the Administrator determines,
12 after public hearing, that a State is not administering
13 and enforcing a program approved pursuant to this
14 subsection in accordance with the guidance published
15 pursuant to paragraph (2) or the requirements of para-
16 graph (5), the Administrator shall so notify the State
17 and, if action which will assure prompt compliance is
18 not taken within ninety days, the Administrator shall
19 withdraw approval of the program. The Administrator
20 shall not withdraw approval of any program unless the
21 State shall have been notified and the reasons for with-
22 drawal shall have been stated in writing and made
23 public.

24 “(7) Nothing in this subsection shall prohibit the
25 Administrator from enforcing any applicable emission

1 standard or requirement under this section or section
2 129.

3 “(m) STATE AUTHORITY.—Nothing in this section shall
4 preclude, deny, or limit any right of any State or political
5 subdivision thereof to adopt or enforce any regulation, re-
6 quirement or standard (including any procedural requirement)
7 which is more stringent than a regulation, requirement, or
8 standard in effect under this section or that applies to a sub-
9 stance not subject to this section.

10 “(n) HYDROGEN SULFIDE.—The Administrator is di-
11 rected to assess the hazards to public health and the environ-
12 ment resulting from the emission of hydrogen sulfide associat-
13 ed with the extraction of oil and natural gas resources. To
14 the extent practicable, the assessment shall build upon and
15 not duplicate work conducted for an assessment pursuant to
16 section 8002(m) of the Solid Waste Disposal Act and shall
17 reflect consultation with the States. The assessment shall in-
18 clude a review of existing State and industry control stand-
19 ards, techniques, and enforcement. The Administrator shall
20 report to the Congress within twenty-four months of the en-
21 actment of this paragraph with the findings of such assess-
22 ment, together with any recommendations, and shall develop
23 and implement a control strategy for emissions of hydrogen
24 sulfide as appropriate to protect human health and the envi-
25 ronment, based on the findings of such assessment, using au-

1 thorities under this Act including sections 111 and this
2 section.

3 “(o) SAVINGS CLAUSE.—No amendment to this section
4 made by the Toxics Release Prevention Act of 1989 shall
5 affect any emission standard for a hazardous air pollutant
6 which has been promulgated prior to the enactment of such
7 Act. Emission standards for categories of sources of radionu-
8 clides may be established in accordance with section 112 of
9 the Clean Air Act as in effect prior to the enactment of the
10 Toxics Release Prevention Act of 1989.

11 “(p) STUDY OF RISK ASSESSMENT.—The Administra-
12 tor shall conduct a review of risk assessment methods used
13 by the Agency to determine the carcinogenic risks associated
14 with exposure to various hazardous air pollutants and source
15 categories and subcategories subject to the requirements of
16 this section and report to the Congress the results of such
17 review not later than twenty-four months after the date of
18 enactment of this subsection. As an element of such review,
19 the Administrator shall examine the factors which may con-
20 tribute to overestimating or underestimating such risks in-
21 cluding the exposure parameters used in establishing carcino-
22 genic risk estimates for the most exposed individual. The Ad-
23 ministrator shall compare the parameters used in risk assess-
24 ments for hazardous air pollutants conducted by the Agency
25 with actual conditions of exposure and comparable assump-

1 tions made for exposure to other environmental threats and
2 shall seek the views of the National Research Council on
3 such parameters. The Administrator shall include in the
4 report a description of the range of risks, the number of per-
5 sons exposed at various levels of risk and the cancer inci-
6 dence for source categories and subcategories which are
7 listed pursuant to subsection (e)(1)(A). The report shall also
8 include a summary of information and methods for assessing
9 the risk of adverse human health effects for pollutants and
10 effects other than carcinogenicity (including, but not limited
11 to, inheritable genetic mutations, birth defects, and reproduc-
12 tive dysfunctions) where no threshold for safe exposure may
13 be determined.

14 “(q) ANNUAL REPORT.—Not later than January 15,
15 1991, and within one hundred five days of the close of the
16 fiscal year for each fiscal year thereafter, the Administrator
17 shall prepare and transmit to the Congress a comprehensive
18 report on the measures taken by the Agency and by the
19 States to implement the provisions of this section and section
20 129. The Administrator shall maintain a database on pollut-
21 ants and sources subject to the provisions of this section and
22 shall include aggregate information from the database, in
23 each annual report. The report shall include, but not be
24 limited to—

1 “(1) a status report on standard-setting under sub-
2 sections (d), (f), and (g);

3 “(2) information with respect to compliance with
4 such standards including the costs of compliance expe-
5 rienced by sources in various categories and sub-
6 categories;

7 “(3) development and implementation of the
8 national urban air toxics program;

9 “(4) recommendations of the Chemical Safety and
10 Hazard Investigation Board with respect to the pre-
11 vention and mitigation of sudden, accidental releases;
12 and

13 “(5) such recommendations for additional legisla-
14 tion to achieve the purposes of this section and section
15 129 as the Administrator may deem appropriate.

16 “(r) AUTHORIZATION.—There are authorized to be ap-
17 propriated such sums as are necessary to carry out the provi-
18 sions of this section.”.

19 SEC. 3. The Clean Air Act is amended by adding the
20 following new section:

21 “PREVENTION OF SUDDEN, ACCIDENTAL RELEASES

22 “SEC. 129. (a) PURPOSE AND GENERAL DUTY.—It
23 shall be the objective of the regulations and programs author-
24 ized under this section to prevent the sudden, accidental re-
25 lease and to minimize the consequences of any such release of
26 any substance listed pursuant to subsection (b) or any other

1 extremely hazardous substance. The owners and operators of
2 facilities producing, processing, handling, or storing such sub-
3 stances have a general duty to identify hazards resulting from
4 such releases using appropriate hazard assessment tech-
5 niques, to design and maintain a safe facility taking such
6 steps as are necessary to prevent releases, and to minimize
7 the consequences of sudden, accidental releases which do
8 occur. Nothing in this subsection shall be interpreted, con-
9 strued, or applied to create any liability for compensation for
10 bodily injury or property damages to any person which may
11 result from sudden, accidental releases of such substances.

12 “(b) LIST OF SUBSTANCES.—The Administrator shall,
13 not later than twelve months after the date of enactment of
14 this section, propose and, not later than twenty-four months
15 after such date, promulgate, a list of not less than fifty sub-
16 stances which may, as the result of sudden events, be re-
17 leased in concentrations that may reasonably be anticipated
18 to cause acute adverse health effects in humans. The list
19 shall be drawn from, but not be limited to, those substances
20 on the list established by section 302 of the Emergency Plan-
21 ning and Community Right-to-Know Act of 1986 and shall
22 include those substances with the greatest likelihood to cause
23 death, injury, property damage, or evacuations as the result
24 of sudden, accidental releases. The initial list shall include
25 sulfuric acid, chlorine, anhydrous ammonia, hydrochloric

1 acid, sodium hydroxide, methyl chloride, phosphoric acid,
2 ethylene oxide, toluene, vinyl chloride, methyl alcohol, nitric
3 acid, styrene, tetrachloroethylene, ammonia, hydrogen sul-
4 fide, acetone, methylene chloride, benzene, methyl ethyl
5 ketone, toluene diisocyanate, phosgene, polyvinyl chloride,
6 sulfur dioxide (10 per centum or more by volume), formalde-
7 hyde, butadiene, hydrofluoric acid, and acrylonitrile. The Ad-
8 ministrator shall from time to time (but not less often than
9 every five years) review and revise the list established by this
10 subsection adding substances which, as a result of sudden
11 events, may be released in concentrations that may reason-
12 ably be anticipated to cause acute adverse health effects in
13 humans. At the time any substance is placed on such list, the
14 Administrator shall establish a threshold quantity for such
15 substance, taking into account the toxicity (including short-
16 and long-term health effects), reactivity, volatility, dispersi-
17 bility, combustibility, or flammability of the substance.

18 “(c) HAZARD ASSESSMENTS.—

19 “(1) Not later than twelve months after a sub-
20 stance is listed under subsection (b), the owner or oper-
21 ator of each facility at which such substance is present
22 in amounts greater than the threshold quantity shall
23 conduct and complete a hazard assessment for each
24 such substance present at the facility. The purpose of
25 such assessment shall be to anticipate the consequences

1 of a range (including worst case events) of sudden, ac-
2 cidental releases of such substances from the facility
3 and to provide information that may aid in the preven-
4 tion, or mitigation, of or response to such releases.

5 “(2) Not later than twelve months after the date
6 of enactment of this subsection the Administrator shall
7 propose and not later than twenty-four months after
8 such date publish guidance with respect to the prepara-
9 tion of hazard assessments. In preparing such guidance
10 the Administrator shall review and require, as appro-
11 priate, each of the following elements—

12 “(A) basic data on the facility, units at the
13 facility which contain or process substances listed
14 under subsection (b) (including the longitude and
15 latitude of such units), facility operating proce-
16 dures, population of the nearby communities, and
17 the meteorology of the area where the facility is
18 located;

19 “(B) an identification of the potential sources
20 of sudden, accidental release from the facility of
21 substances listed under subsection (b);

22 “(C) an identification of any previous such
23 releases from the facility for which a report was
24 required under this or other laws, including the
25 amounts released, frequencies, and durations;

1 “(D) an identification of a range (including
2 worst case events) of potential releases from the
3 facility including an estimate of the size, concen-
4 tration, and duration of such potential releases
5 and a correlation of such factors with the distance
6 from the source of release;

7 “(E) a determination of potential exposure
8 (including the concentration and duration of expo-
9 sure) for all persons who may be put at risk as
10 the result of a sudden, accidental release from the
11 facility;

12 “(F) a determination of the probability of ex-
13 posure as the result of various release scenarios
14 including consideration of meteorological factors;

15 “(G) information on the toxicity of the sub-
16 stances listed under subsection (b) present at the
17 facility;

18 “(H) a review of the efficacy of various re-
19 lease prevention and control measures; and

20 “(I) a sensitivity analysis with respect to the
21 uncertainties and assumptions incorporated in the
22 hazard assessment.

23 “(3) Each hazard assessment prepared pursuant
24 to this subsection shall be updated biennially. Hazard
25 assessments shall not be required to include potential

1 releases from rolling stock infrequently and temporarily
2 located at the facility but shall consider hazards with
3 respect to the substances contained in rolling stock
4 which are regularly present. For purposes of this sub-
5 section, the term 'facility' does not include the right-of-
6 way of a railroad outside of any railroad yard.

7 “(4) to the maximum extent practicable, the Ad-
8 ministrator shall coordinate requirements for hazard as-
9 sessments under this section with any comparable re-
10 quirements that may be imposed by the Occupational
11 Safety and Health Administration including joint pro-
12 mulgation of regulations: *Provided*, That, impacts of
13 potential releases on human health and property out-
14 side the boundary of the facility are fully considered in
15 any such regulation, that hazard assessments be avail-
16 able to the public as provided in this subsection and
17 that nothing in such regulation is interpreted, con-
18 strued, or applied to preclude or diminish the right of
19 any State or a political subdivision thereof to impose
20 requirements for hazard assessment or accident preven-
21 tion and mitigation more stringent than those estab-
22 lished under such regulations.

23 “(5) To the extent practicable, and where there
24 are a large number of small facilities with similar busi-
25 ness and operating characteristics which are likely to

1 present similar risks of sudden, accidental releases of
2 extremely hazardous substances, the Administrator
3 shall facilitate compliance with the requirements of this
4 subsection by designing generic hazard identification
5 and assessment tools including training manuals,
6 checklists, and workbooks which would be useful to the
7 owners and operators of such facilities. The Adminis-
8 trator is authorized to cooperate with trade associa-
9 tions and other organizations representing such facili-
10 ties and other advisory groups to develop hazard iden-
11 tification and assessment materials and to conduct
12 training programs in the use of such materials.

13 “(6) Hazard assessments prepared pursuant to the
14 requirements of this subsection shall be available to the
15 Administrator, to the Chemical Safety and Hazard In-
16 vestigation Board, to the State in which the facility is
17 located, to any local emergency planning entity or
18 public safety agency having responsibility for planning
19 or response with respect to sudden, accidental releases
20 which may occur at such facility, and to the public
21 subject to the conditions of sections 322, 323, and 324
22 of the Emergency Planning and Community Right-to-
23 Know Act of 1986.

24 “(7) As a part of the guidance published pursuant
25 to paragraph (2), the Administrator may collect and

1 publish information on accident scenarios and conse-
2 quences covering a range of possible events for sub-
3 stances listed under subsection (b). The Administrator
4 shall establish a program of long-term research to de-
5 velop and disseminate information on methods and
6 techniques of hazard assessment which may be useful
7 in improving and validating the procedures employed in
8 the preparation of hazard assessments under this
9 subsection.

10 "(c) CHEMICAL SAFETY BOARD.—

11 "(1) There is hereby established within the Envi-
12 ronmental Protection Agency an independent safety
13 board to be known as the Chemical Safety and Hazard
14 Investigation Board.

15 "(2) The Board shall consist of five members in-
16 cluding a chairperson who shall be appointed by the
17 President, by and with the advice and consent of the
18 Senate. Two members of the Board shall be appointed
19 by the Administrator of the Environmental Protection
20 Agency, one member shall be appointed by the Secre-
21 tary of Labor, and one member shall be appointed by
22 the Secretary of Transportation. With the exception of
23 the chairperson, members may be designated from per-
24 sonnel of agencies of the United States. Members of
25 the Board shall be appointed on the basis of technical

1 qualification, professional standing, and demonstrated
2 knowledge in the fields of accident reconstruction,
3 safety engineering, human factors, chemical safety,
4 toxicology, or chemical regulations.

5 “(3) The terms of office of members of the Board
6 shall be five years. Any member of the Board, includ-
7 ing the chairperson as determined by the President,
8 may be removed for inefficiency, neglect of duty, or
9 malfeasance in office.

10 “(4) the chairperson shall be the chief executive
11 officer of the Board and shall exercise the executive
12 and administrative functions of the Board.

13 “(5) The Board shall—

14 “(A) investigate (or cause to be investigated),
15 determine and report to the public in writing the
16 facts, conditions, and circumstances and the cause
17 or probable cause of any sudden, accidental re-
18 lease involving the production, processing, han-
19 dling, or storage of chemical substances resulting
20 in a fatality, serious injury, or substantial property
21 damages;

22 “(B) issue periodic reports to the Congress,
23 Federal, State, and local agencies, including the
24 Environmental Protection Agency and the Occu-
25 pational Safety and Health Administration, con-

1 cerned with the safety of chemical production,
2 processing, handling and storage, and other inter-
3 ested persons recommending measures to reduce
4 the likelihood or the consequences of sudden, acci-
5 dental release and proposing corrective steps to
6 make chemical production, possession, handling,
7 and storage as safe and free from risk of injury as
8 is possible and may include in such reports pro-
9 posed rules or orders which should be issued by
10 the Administrator under the authority of this sec-
11 tion or the secretary of Labor under the the Occu-
12 pational Safety and Health Act to prevent or min-
13 imize the consequences of any release of sub-
14 stances that may have an acute adverse effect on
15 human health as a result of sudden events; and

16 “(C) establish by regulation requirements
17 binding on persons for reporting accidental re-
18 leases subject to the Board’s investigatory juris-
19 diction under this paragraph: *Provided*, That, re-
20 porting releases to the National Response Center,
21 in lieu of the Board directly, shall satisfy such
22 regulations: *And provided further*, That, the
23 Center shall promptly notify the Board of any re-
24 leases which are within the Board’s jurisdiction.

1 “(6) The Board shall coordinate its actions under
2 paragraph (5) with investigations and studies conducted
3 by other agencies of the United States having a re-
4 sponsibility to protect public health and safety, but in
5 no event shall the Board forgo an investigation where
6 a sudden, accidental release involving the production,
7 processing, handling, or storage of a chemical sub-
8 stance causes a fatality or serious injury among the
9 general public. The Board shall enter into a memoran-
10 dum of understanding with the National Transportation
11 Safety Board to assure coordination of functions and to
12 limit duplication of activities which shall designate the
13 National Transportation Safety Board as the lead
14 agency for the investigation of releases which are
15 transportation related.

16 “(7) The Board is authorized to conduct research
17 and studies with respect to the potential for the
18 sudden, accidental release of substances subject to sec-
19 tion 302 of the Emergency Planning and Community
20 Right-to-Know Act of 1986 and other extremely haz-
21 ardous substances, whether or not an accidental release
22 has occurred, where there is evidence which indicates
23 the presence of a potential hazard or hazards. To the
24 extent practicable, the Board shall conduct such studies
25 in cooperation with other Federal agencies having

1 emergency response authorities, State and local gov-
2 ernmental agencies and associations and organizations
3 from the industrial, commercial, and nonprofit sectors.

4 “(8) No part of the conclusions findings, or recom-
5 mendations of the Board relating to any event or the
6 investigation of such event shall be used as evidence
7 on any suit or action for damages resulting from a re-
8 lease which the Board investigates under this section.

9 “(9) Not later than eighteen months after the date
10 of enactment of this section, the Board shall publish a
11 report accompanied by recommendations to the Admin-
12 istrator on the use of hazard assessments in preventing
13 the occurrence and minimizing the consequences of
14 sudden, accidental releases of extremely hazardous sub-
15 stances. The recommendations shall include a list of
16 extremely hazardous substances (including threshold
17 quantities for such substances) and categories of facili-
18 ties for which hazard assessments would be an appro-
19 priate measure to aid in the prevention of accidental
20 releases and to minimize the consequences of those re-
21 leases that do occur. The recommendations shall also
22 include a description of the information and analysis
23 which would be appropriate to include in any hazard
24 assessment. The Board may from time to time review
25 and revise its recommendations under this paragraph.

1 “(10) Whenever the Board submits a recommen-
2 dation with respect to the safety of chemical produc-
3 tion, processing, handling, and storage to the Adminis-
4 trator, the Administrator shall respond to such recom-
5 mendation formally and in writing not later than one
6 hundred and eighty days after receipt thereof. The re-
7 sponse to the Board's recommendation by the Adminis-
8 trator shall indicate whether the Administrator will—

9 “(A) initiate a rulemaking or issue such
10 orders as are necessary to implement the recom-
11 mendation in full or in part, pursuant to any time-
12 table contained in the recommendation;

13 “(B) decline the initiate a rulemaking or
14 issue orders as recommended.

15 Any determination by the Administrator not to imple-
16 ment a recommendation of the Board or to implement
17 a recommendation only in part, including any variation
18 from the schedule contained in the recommendation,
19 shall be accompanied by a statement from the Adminis-
20 trator setting forth the reasons for such determination.

21 “(11) The Board, or upon authority of the Board,
22 any member thereof, any administrative law judge em-
23 ployed by or assigned to the Board, or any officer or
24 employee duly designated by the Board, may for the

1 purpose of carrying out duties authorized by paragraph
2 (5)(a)—

3 “(A) hold such hearings, sit and act at such
4 times and places, administer such oaths, and re-
5 quire by subpoena or otherwise attendance and
6 testimony of such witnesses and the production of
7 evidence and may require by order that any
8 person engaged in the production, processing,
9 handling, or storage of chemical substances submit
10 written reports and responses to requests and
11 questions within such time and in such form as
12 the Board may require; and

13 “(B) upon presenting appropriate credentials
14 and a written notice of inspection authority, enter
15 any property where a sudden, accidental release
16 causing a fatality, serious injury or substantial
17 property damage has occurred and do all things
18 therein necessary for a proper investigation pursu-
19 ant to paragraph (5)(a) and inspect at reasonable
20 times records, files, papers, processes, controls,
21 and facilities and take such samples as are rele-
22 vant to such investigation.

23 “(12) The Board is authorized to establish such
24 procedural and administrative rules as are necessary to
25 the exercise of its functions and duties. The Board is

1 authorized without regard to section 5 of title 41 of the
2 United States Code to enter into contracts, leases, co-
3 operative agreements or other transactions as may be
4 necessary in the conduct of the duties and functions of
5 the Board with any other agency, institution, or
6 person.

7 “(13) The Administrator shall provide to the
8 Board such support and facilities as may be necessary
9 for operation of the Board.

10 “(14) Any records, reports, or information ob-
11 tained by the Board shall be available to the public,
12 except that upon a showing satisfactory to the Board
13 by any person that records, reports, or information, or
14 particular part thereof (other than release or emissions
15 data) to which the Board has access, if made public, is
16 likely to cause substantial harm to the person's com-
17 petitive position, the Board shall consider such record,
18 report, or information or particular portion thereof con-
19 fidential in accordance with section 1905 of title 18 of
20 the United States Code, except that such record,
21 report, or information may be disclosed to other offi-
22 cers, employees, and authorized representatives of the
23 United States concerned with carrying out this Act or
24 when relevant under any proceeding under this Act.
25 This paragraph does not constitute authority to with-

1 hold records, reports, or information from the
2 Congress.

3 “(15) The Board shall submit an annual report to
4 the President and to the Congress which shall include,
5 but not be limited to, information on sudden, accidental
6 releases which have been investigated by or reported
7 to the Board during the previous year, recommenda-
8 tions for legislative or administrative action which the
9 Board has made, the actions which have been taken by
10 the Administrator or the heads of other agencies to im-
11 plement such recommendations, an identification of pri-
12 orities for study and investigation in the succeeding
13 year, progress in the development of risk-reduction
14 technologies and the response to and implementation of
15 significant research findings on chemical safety in the
16 public and private sector.

17 “(16) There are authorized to be appropriated to
18 carry out the provisions of this subsection not to
19 exceed \$12,000,000 in each of the fiscal years ending
20 September 30, 1990, 1991, 1992, 1993, and 1994.

21 “(d) ACCIDENT PREVENTION.—In order to prevent the
22 release of substances listed pursuant to subsection (b) or other
23 extremely hazardous substances (which may cause acute ad-
24 verse effects on human health as the result of sudden events)
25 from devices and systems (including, but not limited to,

1 pumps, compressors, valves, flanges, connectors, containers,
2 and vessels but not including rolling stock), the Administrator
3 may promulgate release prevention, detection, and correction
4 requirements which may include monitoring, recordkeeping,
5 reporting, training, vapor recovery, secondary containment,
6 and other design, equipment, work practice, and operational
7 requirements. Regulations promulgated under this subsection
8 may make distinctions between various types, classes, and
9 kinds of facilities, devices, and systems taking into consider-
10 ation factors including, but not limited to, the size, location,
11 process, process controls, quantity of substances handled, po-
12 tency of substances, and response capabilities present at any
13 facility. In carrying out the authority of this subsection, the
14 Administrator shall consult with the Secretary of Labor and
15 seek to coordinate any requirements under this subsection
16 with any requirements established for comparable purposes
17 by the Occupational Safety and Health Administration.

18 “(e) ORDER AUTHORITY.—

19 “(1) In addition to any other action taken, when
20 the Administrator determines that there may be an im-
21 minent and substantial endangerment to the public
22 health or welfare or the environment because of an
23 actual or threatened release of a substance listed pur-
24 suant to subsection (b) or other extremely hazardous
25 substance from a facility, the Administrator may secure

1 such relief as may be necessary to abate such danger
2 or threat, and the district court of the United States in
3 the district in which the threat occurs shall have juris-
4 diction to grant such relief as the public interest and
5 the equities of the case may require. The Administrator
6 may also, after notice to the State in which the facility
7 is located, take other action under this subsection in-
8 cluding, but not limited to, issuing such orders as may
9 be necessary to protect human health, welfare, or the
10 environment.

11 “(2) Any person who willfully violates, or fails or
12 refuses to comply with, any order of the Administrator
13 under paragraph (1) may, in an action brought in the
14 appropriate United States district court to enforce such
15 order, be fined not more than \$25,000 for each day in
16 which such violation occurs or failure to comply
17 continues.

18 “(3) Within one hundred and eighty days after en-
19 actment of this section, the Administrator shall publish
20 guidance for using the order authorities established by
21 this subsection. Such guidance shall provide for the co-
22 ordinated use of the authorities of this subsection with
23 other emergency powers authorized by section 106 of
24 the Comprehensive Environmental Response, Compensa-
25 tion and Liability Act, sections 311(c), 308, 309, and

1 504(a) of the Federal Water Pollution Control Act,
2 sections 3007, 3008, 3013, and 7003 of the Solid
3 Waste Disposal Act, sections 1445 and 1431 of the
4 Safe Drinking Water Act, sections 5 and 7 of the
5 Toxic Substances Control Act, and sections 113, 114,
6 and 303 of this Act.

7 “(e) **PRESIDENTIAL REVIEW.**—The President shall
8 conduct a review of release prevention, mitigation, and re-
9 sponse authorities of the various Federal agencies and shall
10 clarify and coordinate agency responsibilities to assure the
11 most effective and efficient implementation of such authorities
12 and to identify any deficiencies in authority or resources
13 which may exist. The President may utilize the resources and
14 solicit the recommendations of the Board in conducting such
15 review. At the conclusion of such review, but not later than
16 twenty-four months after the date of enactment of this sec-
17 tion, the President shall transmit a message to the Congress
18 on the release prevention, mitigation, and response activities
19 of the Federal Government making such recommendations
20 for change in law as the President may deem appropriate.
21 Nothing in this subsection shall be interpreted, construed, or
22 applied to authorize the President to modify or reassign re-
23 lease prevention, mitigation, or response authorities other-
24 wise established by law.

1 “(f) STATE AUTHORITY.—Nothing in this section shall
2 preclude, deny, or limit any right of a State or political subdi-
3 vision thereof to adopt or enforce any regulation, require-
4 ment, or standard (including any procedural requirement)
5 that is more stringent than a regulation, requirement, or
6 standard in effect under this section or that applies to a sub-
7 stance not subject to this section.

8 “(g) AUTHORIZATION.—There are authorized to be ap-
9 propriated to the Administrator such sums as may be neces-
10 sary to carry out the provisions of this section.”.

11 SEC. 4. (a) Section 113(c)(1) of the Clean Air Act is
12 amended by striking “shall be punished” and all that follows
13 through the end of the paragraph and inserting in lieu thereof
14 “shall be punished by a fine of not less than \$5,000 nor more
15 than \$50,000 per day of violation, or by imprisonment for not
16 more than three years, or by both. If a conviction of such
17 person is for a violation committed after a first conviction of
18 such person under this paragraph, punishment shall be by a
19 fine of not more than \$100,000 per day of violation, or by
20 imprisonment of not more than six years, or by both.”.

21 (b) Section 113(c)(2) of the Clean Air Act is amended by
22 striking “\$10,000” and inserting in lieu thereof “\$25,000”;
23 and by striking “six months” and inserting in lieu thereof
24 “two years”.

1 (c) Section 111(d)(1) of the Clean Air Act is amended by
2 striking "112(b)(1)(A)" and inserting in lieu thereof "112(b)".

3 (d) Section 111 of the Clean Air Act is amended by
4 striking paragraphs (g)(5) and (g)(6) and redesignating the
5 succeeding paragraphs accordingly. Such section is further
6 amended by striking "or section 112" in paragraph (g)(7).

7 (e) Section 113 of the Clean Air Act is amended by
8 striking "112(c)" wherever it occurs and inserting in lieu
9 thereof "112".

10 (f) Section 113 of the Clean Air Act is amended by in-
11 serting "section 129 (relating to accident prevention),"
12 before "or 119(g)" in subsection (a)(3). Such section is fur-
13 ther amended by inserting "section 129 (relating to accident
14 prevention)," before "subsection (d)(5)" in subsection (b)(3).
15 Such section is further amended by inserting "section 129,"
16 after "section 112," in subsection (c)(1)(C).

17 (g) Section 114(a) of the Clean Air Act is amended by
18 striking "or" after "section 111," and by inserting ", or any
19 accident prevention regulation under section 129," after
20 "section 112".

21 (h) Section 118(b) of the Clean Air Act is amended by
22 striking "112(c)" and inserting in lieu thereof "112(i)(3)".

23 (i) Section 302(k) of the Clean Air Act is amended by
24 adding before the period at the end thereof ", and any design,
25 equipment, work practice, or operational standard authorized

1 by this Act constitutes a violation of an 'emission standard'
2 whether or not an air pollutant is emitted to the ambient
3 air."

4 (j) Section 304(b)(1) of the Clean Air Act is amended by
5 striking "112(c)(1)(B)" and inserting in lieu thereof "112".

6 (k) Section 307(b)(1) is amended by striking "112(c)"
7 and inserting in lieu thereof "112".



CLEAN AIR ACT AMENDMENTS OF 1989

S. 196, THE MUNICIPAL WASTE COMBUSTION ACT OF 1989

THURSDAY, SEPTEMBER 21, 1989

U.S. SENATE,
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS,
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION,
Washington, DC.

The subcommittee met, pursuant to recess, at 3:07 p.m., in room 406, Dirksen Senate Office Building, Hon. Max Baucus (chairman of the subcommittee) presiding.

Present: Senators Baucus, Chafee, Graham, and Durenberger.

OPENING STATEMENT OF HON. MAX BAUCUS, U.S. SENATOR FROM THE STATE OF MONTANA

Senator BAUCUS. The hearing will come to order.

This morning we focused on S. 816, which is air toxics legislation. We will now turn to S. 196, which is legislation to control municipal solid waste incinerator emissions and ash disposal.

Before I start, however, I want to acknowledge the leadership of the chairman of the full committee, Senator Burdick, who is not here but who has helped in this effort, as well as Senator Durenberger, who also has joined in with the chairman of the full committee on this and many other efforts. I must say, he probably has as great a stamp on legislation to come out of this committee as any other member—in the many years that I have been on this committee, at least.

I think S. 196 fills a void, because today many incinerators are operating without adequate pollution controls. Today the type of ash management that is necessary to ensure safe disposal is uncertain. This legislation attempts to address that uncertainty. It clarifies the status of ash disposal requiring treatment, monitoring, and disposal in lined landfills. It also requires stringent controls on incineration, requiring gas scrubbers, particulate controls, and good combustion practices.

It further sets limits for carbon monoxide particulates, sulfur dioxide, hydrogen chloride, and combustion temperature.

This afternoon we will hear from various witnesses. This has been a problem that has been brewing. It has undertaken many twists and turns—some administrative, some legislative, and some

judicial. It is our hope that this hearing will help us resolve it and find a legislative solution as quickly as we possibly can.

Senator Chafee.

**OPENING STATEMENT OF HON. JOHN H. CHAFEE, U.S. SENATOR
FROM THE STATE OF RHODE ISLAND**

Senator CHAFEE. Thank you, Mr. Chairman. Again, I want to thank you for the excellent leadership you've given on the Clean Air bill as a whole, but particularly in this area where we are having the hearing today; namely, the toxic air emissions.

At present, more than 200 municipal solid waste incinerators are in the process of being designed or built. In my own State, the law requires us to build three Statewide incinerators in the next several years.

For most municipalities, the cost of an incinerator probably is the largest expense that a municipality will have, reaching close to \$200 million in many instances. So it seems to me these municipalities should not have to commit this kind of money if we are going to continue to change the rules. The Federal Government should provide a stable regulatory environment for the construction of these incinerators.

I also believe that the whole solid waste issue should be dealt with comprehensively. By that I mean not solely incineration, but also it should be accompanied with a very solid, aggressive source reduction program and recycling. In many cases, incineration is a legitimate component of this overall strategy of dealing with solid waste.

In particular, Mr. Chairman, I want to recognize Burt Stallwood, who is here representing the National League of Cities. Mr. Stallwood has been town administrator and mayor of Lincoln, Rhode Island, since 1973, which makes him some sort of a record holder as far as a senior official in any city or town in our State, where we have rapid turnover due to a variety of reasons.

It is very hard to keep citizens satisfied.

I will just tell you that the coach of football at Yale once said he strove to keep the alumni sullen but not rebellious.

That's what a mayor strives to do, too.

So Mr. Stallwood is here as Chairman of the Energy and Environment and Natural Resource Committee of the National League of Cities.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you very much, Senator Chafee.

Senator Graham.

**OPENING STATEMENT OF HON. BOB GRAHAM, U.S. SENATOR
FROM THE STATE OF FLORIDA**

Senator GRAHAM. Thank you very much, Mr. Chairman. I want to thank you, again, for this series of hearings on important issues that will build towards the Clean Air Act. This legislation on municipal waste incineration is a very important one for our State. Our State, like many others, is faced with a Hobson's choice in terms of the disposal of solid waste. We are finding it increasingly difficult to locate sites that are environmentally appropriate for

the traditional means of disposal, which has been a ground fill disposal. We recognize the value that waste minimization and recycling can play in municipal waste management. Incineration becomes the best alternative once these steps are taken.

The challenge that we face is how to make these incineration facilities environmentally sound without precluding their use for economic factors. We are not talking about private disposal firms, in most cases, but municipalities which must issue bonds to finance the construction or enhancement of these incineration facilities.

Mr. Chairman, I particularly appreciate your extending an invitation today to participate to a good friend and fellow Floridian, Barbara Sheen Todd. Ms. Todd is a commissioner of Pinellas County, Florida. She has been active in many important areas in our State. She has been especially vigilant as an advocate for high environmental standards, whether it be the appropriate uses of our continental shelf, or the appropriate methods of disposal of municipal waste. I am very pleased that she is here to share her experience with the committee.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you very much, Senator.

Senator Durenberger.

**OPENING STATEMENT OF HON. DAVE DURENBERGER, U.S.
SENATOR FROM THE STATE OF MINNESOTA**

Senator DURENBERGER. Thank you, Mr. Chairman.

Somehow, when I think about Bob Graham's State and solid waste it just seems like one can't dig a very deep hole in Florida.

I can imagine Bob's problem. But it comes as no surprise to anybody to know that my State has a big problem, and Rhode Island has a big problem because it is small, and Max's State has got a problem in part because it is big. We're all experiencing this municipal waste problem in much the same way.

I want to express my gratitude to the chairman of this subcommittee, who didn't really ask to be an expert on clean air and, as John Chafee said, he is now our expert on clean air. He was supposed to be our expert on RCRA. Part of RCRA is solid waste, and part of solid waste is municipal incineration, and so we work our way down to this hearing this afternoon not because the chairman of the subcommittee set out to be the clean air expert, but because he was the RCRA expert and now, because he has done all this work on clean air, it is pretty clear to him that there is a direct connection between the fact that we can't get incinerators built where we need them, or when we built them we can't operate them, like in Minneapolis and Bemidji and other little towns in Minnesota.

So my appreciation for the Senator from Montana is for his willingness to take an hour or so here in the middle of a busy afternoon at the very beginning of hearings on clean air to tie the municipal incinerator problem in with the clean air problem. I appreciate his logic.

I appreciate the time, Max, that you've committed to this effort.

I look forward to everybody being here. I want to welcome back Allen Moore, as long as we're introducing people. I can't find any-

body here from Minnesota, unless I have missed something. But those of us on the Finance Committee grew up with Allen as Jack Danforth's brains—at least some of the time—and that's when there was no such thing as the National Association on Solid Waste. But people like Allen and others have given waste a good name.

It is nice to see you back.

Senator BAUCUS. Thank you, Senator.

Our panel includes: Mayor Stallwood, who has already been introduced to some extent by Senator Chafee; Richard Denison, a senior scientist for the Environmental Defense Fund; Allen Moore, who is the President of the National Solid Waste Management Association; Barbara Todd, County Commissioner of Pinellas County, Florida; Roger Etter, Director of Technical Services for John Zinc Company; and John Norton, Director of Solid Waste Management Department for the American Society of Mechanical Engineers; as well as Allen Hershkowitz, Senior Scientist, the National Resources Defense Council.

Let's begin with you, Mayor. Please start off.

Mayor STALLWOOD. Thank you very much, Senator.

If I may, before I start I'd like to get permission to enter in the National Municipal Policy of the League on solid and hazardous waste, if I may.¹

Senator BAUCUS. Before you begin, let me encourage each of you to summarize your statements. All statements will automatically be included in the record.

There will be a 5-minute rule. Four minutes green light; one minute amber; red means time is up.

Please go ahead.

STATEMENT OF MAYOR BURTON STALLWOOD, NATIONAL LEAGUE OF CITIES

Mayor STALLWOOD. Thank you very much.

I'm here today to testify on behalf of S. 196 for the National League and the 16,000 cities and towns across the Nation that we represent.

I believe this committee is well aware of the problems facing our Nation's cities and towns in arranging for the disposal of municipal solid waste. What we at the local level confront is, in effect, a moratorium on the construction of waste disposal systems.

We believe that the time has come for Federal intervention in addressing some of the more pressing health and safety questions to enable municipalities to move forward with appropriate environmentally sound options for dealing with solid waste.

It is clear that significant parts of the country cannot sustain a viable solid waste program in the presence of continued opposition and Federal inaction in this area.

Given the likelihood that we will see action on a Clean Air Act reauthorization proposal in the 101st Congress, we would urge you to use this opportunity to clarify and regularize the parameters for

¹ See p. 440.

municipal waste combustion facilities for both incinerators and ash disposal facilities.

We have several basic requirements that must be addressed in Federal legislation.

One is certainty. There are over 200 municipal waste combustion facilities currently planned or under construction. We have an urgent need for standards as quickly as possible to ensure that we are protecting our citizens and, at the same time, not squandering scarce local resources.

Two, rational requirements that reflect what can actually be accomplished given the variability of the municipal waste stream.

Three, adequate compliance time.

Four, Federal assistance in reducing and/or eliminating toxics from the municipal waste stream.

Five, designation of incinerator ash as a special waste.

Our need right now is certainty. Municipalities across the country are attempting to deal with their own particular solid waste disposal crisis by investing substantial local resources in construction of incinerators and ash disposal facilities. We cannot afford—either from the financial perspective, or, more importantly, from the perspective of assuring our citizens that these necessary facilities are safe—to find these investments inadequate after the fact.

Two, we have reservations about the incinerator emission limitations proposed in S. 196. While experts tell us that these numbers can be achieved, they also tell us that they cannot be achieved continuously given the variability of the municipal solid waste stream. We would like to work closely with your committee, in conjunction with the technical experts, in developing standards achievable in real-world situations.

Three, any legislation dealing with either incinerators or ash disposal facilities must recognize that existing municipal solid waste disposal facilities must recognize that existing municipal solid waste disposal practices cannot be changed overnight. While the construction of an ash disposal facility could conceivably be completed in 18 months, this does not take into account the need to site, finance, or to permit a new facility.

When developing retrofit or closure mandates, you must keep in mind that we have garbage every day and that we must do something with it in the interim.

Four, in the area of source reduction, we believe that Federal intervention will be essential. We do not believe either the State or local governments can successfully mandate the exclusion of specific product constituents. Municipalities can have only a limited impact on how products are packaged, toxic constituents in products, or the volume of products that are disposable.

Federal laws have the advantage of establishing uniformity Nation-wide. National initiatives to minimize waste don't run afoul of interstate commerce protections.

We certainly appreciate the recognition in S. 196 that neither source reduction nor recycling are best available control technologies. We understand that EPA has given serious consideration to proposing removal of certain items from the waste stream as BACT for purposes of securing an incinerator permit. But let me assure you that municipalities across this country are enthusiastically

pursuing an integrated approach to the solid waste problem, which includes recycling, source reduction, resource recovery, and landfills. Nevertheless, we are concerned about the development of markets for recycled goods. Here, again, we believe Federal intervention such as mandates for Federal agencies and some contractors to use recycled products will ensure that cities and towns do not end up with warehouses filled with unrecycled recyclables.

Fifth, it is certainly our impression that there is much disagreement and uncertainty not only about the hazardous waste and municipal incinerator ash and its leachability, but also the appropriateness of the current test available to determining toxicity. EPA has determined that only Congress can resolve the issue of whether incinerator ash is a hazardous waste and must, therefore, be disposed of in a subtitle C facility, or a non-hazardous waste appropriate for disposal in a subtitle D facility.

While the merits of that argument are best left to those with scientific expertise, from the municipal perspective we would prefer that ash be classified as a special waste and dealt with under subtitle D. Designation of ash as a special waste, accompanied by a Federally-approved protocol for the disposal facility, should facilitate our ability to move forward with incineration as an option for disposal of municipal solid waste.

I wish to restate, Mr. Chairman, that the National League of Cities looks forward to continuing to work with you and the committee on this and other important Clean Air Act issues as Congress moves forward with legislation.

I want to thank you for the opportunity to share our views with you today.

Senator GRAHAM. Thank you very much, Mr. Mayor.

Ms. Todd.

STATEMENT OF BARBARA SHEEN TODD, COUNTY COMMISSIONER, PINELLAS COUNTY, FL

Ms. TODD. Mr. Chairman, before I begin I would like to request that you would direct the record to be held open on this hearing for at least 2 weeks to give us time to prepare full written testimony.

Senator GRAHAM. The record for information of all of those who are testifying will remain open for two weeks for revisions or for supplementation.

Ms. TODD. Thank you.

I hope you will consider our testimony on S. 196 in that light. We do support the fact that you are trying to work to pass the clean air legislation in this Congress, and we appreciate the difficulty of that task.

We are an urban county that is now more than six years into the operation of a highly successful waste-to-energy facility. We have a great deal at stake in this legislation and, for that reason, we are particularly pleased that you have asked us to continue working with you for the passage of responsible legislation.

Pinellas County is a small peninsula jutting into the Gulf of Mexico about midway down on Florida's west coast. We are surrounded on three sides by the beautiful waters of the Gulf of

Mexico and Tampa Bay. In size, we are the smallest county in the State of Florida. But with a population of 850,000 residents and 24 incorporated municipalities, we are totally urbanized, and the most densely populated county in Florida.

If you can imagine that, it might also help you to understand that in protecting the fragile environment of our lovely little county we are faced with some very big constraints and challenges.

We are proud of the way we have met these challenges, but I want to share with you what we consider to be our biggest environmental success story, and that's our solid waste management system.

Recognizing that with our very scarce land area we would need an immediate alternative to landfilling, we turn to resource recovery and to recycling. In Pinellas, we are recycling about 18 percent of our waste stream now; and in the State of Florida they have mandated a goal of 30 percent recycling by 1994 for all counties in Florida.

Pinellas County opted in 1980 to construct a resource recovery facility on a 730-acre tract located in our county. In 1983, the Pinellas waste-to-energy plan began operation. With a current burning capacity of 3,150 tons per day, our plant has been and continues to be an environmental showcase, not only because of its size, but its excellent environmental performance.

The waste that is not recycled prior to disposal comes exclusively to our solid waste facility. We use electrostatic precipitators in three burners, and our mass burn technology reduces the volume of waste that must be landfilled by about 75 percent. In this process, our facility uses garbage as fuel and produces 75 megawatts of electricity—enough to provide power to 40,000 homes.

I want to emphasize to you that the emissions from the Pinellas plant are not the down side of this success story. On the contrary, I would like to enter into the record, as a supplement to my testimony, a copy of the health risk assessment study which was performed on our facility in 1987. Using actual measured emission rates—not assumed emission rates—this report concludes that health risks to the public are insignificant.

The report has been widely distributed for review and comment, including three regulatory agencies—the EPA, the Florida Department of Environmental Regulation, and the State of California Air Resources Board. This report has not been disputed or challenged in the two years that have elapsed since its distribution.

Having given you that information, I would also add that we are not alone. Florida has been a pioneer in environmentally outstanding waste-to-energy facilities, as Senator Graham is very well aware. During his tenure as governor, he supported this technology, recognizing its role in the protection of Florida's aquifer.

Our neighboring county, Hillsborough County, and the City of Tampa lying across the bay, have both worked with us, as have our sister counties in Broward and Pasco, on the legislation you are considering today. The concerns I reference are shared by all of them.

Today I would like to extend an invitation to you on behalf of our board to visit Pinellas County. I would hope that this committee and your staff will consider this invitation and honor us by ac-

cepting. Senator Graham has visited our plant during one of his work days back in 1985.

Senate bill 196 in many respects represents a reasonable approach to the regulation of incinerator emissions and ash, and to that extent we support it.

There are two areas, though, with which we have concerns. One has to do with the acid scrubbers, and the other ash disposal.

We are concerned that the requirement to retrofit our plant with acid gas scrubbers is not justified by any scientific or technical data. Secondly, we are concerned about the fact that there is some mention as to the ash disposal. In retrofitting, we have to shut down each of our three burners for a full year and landfill that garbage instead of burning it. Landfills are an emission source, and this committee needs to understand that the environmental trade-off is involved here.

The benefits which would be derived by retrofitting would not provide a net environmental benefit. And, in addition to all these negatives, there is the cost factor which, as you know, has been estimated to be about \$15 million per unit on an average. In Pinellas, retrofit costs would approach \$100 million.

In addition, there is a provision in this bill for emission standards to be revisited every five years. I want to point out that this would make it virtually impossible to finance these facilities, since our bonds typically are based on a 20-year amortization period.

In regard to ash disposal, our concern is that we co-fill. Our ash goes into two landfills with other material. The bill calls for two or more composite liners in a co-fill situation. Since it is technically impossible for us to put any type of liner in the ground—it would simply pop up because of our high water table—an alternative design section is absolutely necessary for us. It provides that we can use an alternative design if we can demonstrate that our design will prevent leachate migration at least as effectively as the design requirements set forth in the preceding sections.

May I continue? I only have a little more left.

Senator GRAHAM. Go ahead.

Ms. TODD. Because of our truly unique environmental circumstances in Pinellas County, Florida, we strongly support the alternative design language that appears on page 30—section 3(B)(4). But the concern is that this section could be nullified by the requirement for two or more composite liners in the preceding section.

I'll answer other questions as we proceed in the interest of time. Thank you.

Senator GRAHAM. Thank you very much.

Mr. Richard Denison.

STATEMENT OF RICHARD DENISON, SENIOR SCIENTIST, ENVIRONMENTAL DEFENSE FUND

Mr. DENISON. Thank you, Senator Graham, and members of the subcommittee.

As you probably are aware, EDF has been actively involved in the issue of municipal solid waste incineration for a number of

years and, in particular, has focused on the environmental and health concerns surrounding the disposal of incinerator ash.

We continue to support the efforts of the subcommittee to address this important issue, and I would agree wholeheartedly with the statements made at the beginning about the need to develop standards in this area given the large number of operating incinerators and the even larger number of those planned.

We believe that S. 196 embodies much of the legislative framework that is needed to put into place the proper regulatory climate for these facilities.

I'm going to focus today on several aspects of the bill that deal with the issue of incinerator ash management.

EDF, as you are probably aware, has also supported the concept of regulating incinerator ash as a special waste if particular controls are put in place through the new legislation.

Let me first describe what I believe to be the critical need for movement in this area on a relatively quick time frame given the frequently unacceptable risks posed by current management practices for incinerator ash.

In the last 2 years we have witnessed a growing list of instances of grossly improper storage, transportation, and disposal of incinerator ash. A scant two miles from this hearing room, ash from the District of Columbia's incinerator is dumped into low lying areas on the grounds of St. Elizabeth's Hospital next to the Anacostia River. Runoff from that uncovered ash pile drains directly into the river.

Access to the site, which is immediately adjacent to a residential neighborhood, is unrestricted. Hedges that line the street that was used to transport ash to that site are covered even to this day with ash that had leaked from the trucks transporting that material.

This, unfortunately, is not an isolated incident. It is one of a number that we are aware of in the country, and it is one that has led us to believe that we need standards in place as soon as possible.

We cannot overstate the importance of providing comprehensive controls on ash management—those that deal with all phases of its management from the point of generation onward. And I would submit that no other waste better illustrates the need for cradle-to-grave management than does incinerator ash because of its potential for dispersal in the environment by a variety of routes.

Let me now turn to talk about several specific provisions of the bill, which we generally support with the modifications detailed in our written testimony.

Several provisions of the bill would allow for ash to be disposed of in sanitary landfills that do not meet the basic standards of the bill under certain conditions. We are concerned that only ash that has been clearly demonstrated not to pose short- or long-term risks be allowed to be disposed of in such a manner. And we think that the provision in the bill that requires the treatment of fly ash prior to such disposal is a very prudent one.

We also think that there need to be a few more specifications on the types of facilities that can be allowed to take such ash. The bill already requires a liner and a leachate collection system and groundwater monitoring. But we believe that certain additional

controls—particularly restrictions on the use of landfills that are already leaking or are in violation of Federal or State standards governing releases to groundwater and surface water—disposal of ash in such facilities should be prohibited.

With regard to the recycling and reuse or utilization of ash residue, the bill appropriately mandates that the Federal Government and EPA set up standards governing this activity. We think this is very important.

One aspect of the bill that does trouble us is a provision that would allow ash to be utilized even if it leaked at a rate which currently determines that ash to be a hazardous waste. We think that standard is not appropriate for ash to be re-used and put in the general environment, and a much more stringent standard needs to be set there.

Let me turn, finally, to the issue of ash management capacity and the need to ensure that incinerators are not built without adequate assurance that ash can be managed in a manner that is consistent with the provisions of the bill.

There are provisions in the bill that would require certain demonstrations to be made, and we fully support those. I have detailed a couple of concerns we have about the effectiveness and feasibility of those in my testimony, and I'll leave that to the record.

Let me end, finally, by addressing one last issue, which I think the subcommittee draft of the bill right now addresses and is really important, and that is the need to exert control over the input of waste to incinerators as a means of controlling ash toxicity and air emissions.

EDF fully supports the provisions of the bill that would give the administrator the authority to restrict certain types of materials either from commerce or from incinerator waste streams.

I appreciate the opportunity to testify today, and would be happy to work with the subcommittee in fashioning the final bill.

Thank you.

Senator GRAHAM. Thank you very much, Mr. Denison.

Mr. Roger Etter.

STATEMENT OF ROGER ETTER, CHAIRMAN, WASTE COMBUSTION EQUIPMENT INSTITUTE, ACCOMPANIED BY STEVE SHULER, VICE CHAIRMAN

Mr. ETTER. Good afternoon. Thank you, Mr. Graham.

My name is Roger Etter. I am here today as chairman of the Waste Combustion Equipment Institute, a part of the National Solid Waste Management Association. With me is the vice chairman of the Institute, Steve Shuler.

The WCEI supports the position presented by Allen Moore of the NSWMA, but would like to expand on issues of particular concern to our membership.

The WCEI is a trade association representing companies that have developed waste combustion technologies for various specialty waste incineration applications, including not only municipal systems, but also hospital, commercial, medical waste, and hazardous industrial waste combustion facilities.

The WCEI supports the development of a national solid waste management policy based on the integrated waste management approach, and one that provides prompt stability in a waste crisis that is quickly getting out of control.

Environmentally sound incineration plays a key role in this integrated waste management approach. Waste combustion equipment can be designed to complement reduction, recycling, and reuse of waste—not discourage them.

Senate bill 196 primarily addresses the situation confronting large cities and areas of high population density. However, this situation does not exist throughout much of the United States. The proposed legislation, as currently drafted, would effectively preclude the use of a principal alternative for much of the Nation—modern modular incineration systems.

It legislatively sets minimum technology standards using a global definition of municipal incineration facilities, and a large city technology model—waterwall massburn systems with dry scrubber baghouse air pollution control technology—that would prohibit hospitals, commercial facilities, and the small communities of rural America from resolving their waste disposal problems in an environmentally safe and cost-effective manner.

Unless amendments are adopted, state-of-the-art modular incinerators will be precluded in the applications of invaluable service. Many smaller municipalities which generate below 250 tons per day will not be able to construct the large waterwall massburn units. Furthermore, these smaller municipalities will not be able to realistically afford the transport of their waste to large, urban mass burn systems. For example, Fosston, Minnesota, has a 75-ton-per-day modular system that disposes of wastes from five counties in the rural areas. With the shutdown of this facility resulting from the retrofit provisions of the bill and loss of landfill capacity, trucking raw garbage over 200 miles to Minneapolis may be their only option.

Small rural hospitals will likely require similar transport of infectious waste. Unless some alterations are made in the proposed legislation, smaller communities and hospitals will be faced with disproportionate waste disposal costs and be compelled to rely on waste management techniques that are less environmentally sound than incineration.

Attached to this document is an overview of the nature, benefits, and role of modular technology. Briefly, however, the new generation of modular waste combustion systems are predominantly American technologies, emerging from years of development in the U.S.A. These systems typically employ a two-stage design to maximize control of the combustion process.

Modern modular waste combustion technology offers the following advantages: it maximizes pathogen kill effectiveness; it minimizes emissions of potentially toxic organics, such as dioxins; it minimizes formation of nitrogen oxides from nitrogen in the waste; and it minimizes entrainment of particulates and the quantity of fly ash generated.

There are changes that need to be made to Senate bill 196 to assure that this valuable control technology continues to be available.

Attached to this document are specific comments relating to needed changes. In general, however, the WCEI believes that, if the Congress intends to pass legislation which includes specific minimum standards, the law should be neutral with regard to the different types and classes of technology. There should be standards developed for each type and size of incinerator which reflect the technological feasibility appropriate for such systems.

Moreover, this is a rapidly changing technological field. Legislation should not inhibit the development of new, more environmentally desirable products. For example, technology is currently being developed to remove heavy metals from fly ash utilizing wet scrubbing air pollution control processes.

Future standards need to be based on nationally applicable technologies if they are to be nationally applied. Adequate flexibility needs to be included for different sizes, types, classes, categories, feed types, and other factors that may be appropriate.

Monitoring requirements need to be altered to recognize the cost of monitoring on small systems and to allow flexibility to use surrogate operating parameters or monitors.

The WCEI appreciates the opportunity to present testimony at this hearing. Additional information will be submitted for the record regarding the implication of S. 196 as soon as it becomes available.

We look forward to working with the committee staff as appropriate.

Senator GRAHAM. Thank you very much, Mr. Etter.
Mr. Allen Moore.

STATEMENT OF ALLEN MOORE, PRESIDENT, NATIONAL SOLID WASTE MANAGEMENT ASSOCIATION

Mr. MOORE. Thank you Senator Graham and Senator Chafee. It is a personal honor and privilege for me to be here today. I confess to finding it a little daunting that I, a newcomer to the solid waste industry, should be advising the recognized leadership in this field represented by you and by the staffs behind you, but I'm working hard to catch up.

My association, the National Solid Waste Management Association, is the association of the garbage industry in America. We are more than 2,500 private trash haulers, landfill operators, waste-to-energy companies, makers of modular waste combustion systems like Mr. Etter, and recycling companies. It goes without saying that our member companies and the sector that they represent compete with each other in the market place. Today I speak as a single voice for all segments of the industry.

Whatever the Congress decides or doesn't decide on the issues in S. 196 will affect the market place. The members of my association will adapt, and they will dispose of the Nation's trash. Some will gain and some will lose. I'm not here today to pick winners or losers—my members would hang me if I did. I am here to urge you to stay on your present course and address the problem of ash disposal now.

The technical and legal ambiguities surrounding ash disposal requirements cry out for resolution. Nothing less than a law can re-

solve these issues, because the EPA will not and the courts should not.

There is an urgent need for you to establish minimum Federal standards and to clarify the rules. This will not only guarantee the safety of current ash disposal sites, as Mr. Denison mentioned, but also preserve waste-to-energy and waste combustion as waste management tools, which local governments can consider—and I emphasize consider—as options for waste disposal.

We really are running out of disposal space in this country. Eleven years ago there were 20,000 landfills in America; today there are 6,000; in 5 years there will be 4,000. Recycling, alone, won't fill the gap, and neither will waste-to-energy plants, nor new landfills, nor, for that matter, will bans on styrofoam cups or disposable diapers. There is no question that we need to reauthorize RCRA to force integrated waste management planning Nationwide.

The chairman, who has just returned, is in the forefront of the comprehensive RCRA reauthorization effort, and we fully support that effort. But what do we do in the meantime?

For example, what does the State of New Jersey do? Forced to close scores of unsafe or full landfills, New Jersey today exports out of State about half of its municipal waste at enormous expense to New Jersey citizens. Meanwhile, recipient States are trying to close their doors to New Jersey's garbage.

New Jersey has ambitious plans to become self sufficient in waste disposal by 1992. They have mandatory State-wide recycling. They are permitting new, state-of-the art landfills. And they want to build more waste-to-energy plants. Current legal and regulatory uncertainties hinder that.

If you do not know what the air emission standards will be, if you do not know what ash disposal requirements will be, you complicate the permit process, and often you cannot get financing.

An important tool for waste management in many communities is simply not available, but the garbage keeps piling up.

This hearing is an excellent signal to the country that you recognize the catch 22 facing the waste combustion industry. We want to encourage you and help you to preserve the waste-to-energy and waste combustion options. We need to establish rules. We need to be sure that those rules are protective of the environment and of public health and are perceived to be by the public.

My written statement lays out our views at length. Broadly stated, we fully support the S. 196 principle of minimum technical requirements for ash disposal. We believe that Congress should direct the EPA to establish rigorous regulations on an expedited schedule, but leave the details to EPA and its rule-making process.

Similarly, we do not believe that Congress should set specific numerical air emission standards in the statute, nor do we believe that waste combustion facilities should be subject to air emission standards which are not necessary to achieve human health and environmental goals.

We are also concerned that the provisions relating to State solid waste planning and recycling efforts, though correct in concept, are not the aggressive and comprehensive approaches that the country needs and which you, Mr. Chairman, are seeking in S. 1113.

We share the view that these issues deserve the careful scrutiny and deliberation that we understand you contemplate for RCRA reauthorization.

We'd like to work with the committee on the precise details of the measure. The Nation's shrinking solid waste disposal capacity is a time bomb. The problem needs to be dealt with in a comprehensive fashion in RCRA reauthorization. But the step we're discussing today can buy us some time. It doesn't disarm the time bomb, but at least it would lengthen the fuse.

Thank you, Mr. Chairman.

Senator BAUCUS. Thank you, Allen.

Next we will hear from John Norton.

STATEMENT OF JOHN NORTON, DIRECTOR, DEPARTMENT OF SOLID WASTE MANAGEMENT, MONTGOMERY COUNTY, OHIO, REPRESENTING THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS

Mr. NORTON. I am John Norton. I am a registered professional engineer in Ohio. That's one of the places that is receiving the waste from New Jersey, as a matter of fact. I'll get to that later. I appear before you today representing the Solid Waste Processing Division of the American Society of Mechanical Engineers.

This statement represents the views of experts from the Division of Solid Waste Processing rather than an official position of the ASME.

Your attempt to address both ash and air concerns in one bill is laudable. We need regulation and legislation in both areas in order to resolve these issues. However, we do have concerns in both areas as they are presently addressed in this legislation.

We specifically appreciate the bill's repeated reference to the promulgation of regulations designed to preserve and protect the public's health and environment. I went through the bill this morning, and I believe that public health and environment is referenced 20 times. On page 24 we even have a clarification where it says that the EPA should make sure that a reasonable degree of certainty is employed when they promulgate the regulation to make sure that the regulation is, in fact, necessary to protect the public health and the environment.

We heartily concur that this should be the main objective of regulations for municipal waste combustion. Unfortunately, that focus has occasionally been lost in the haste of promulgating regulations to protect the public from all-too-unlikely worst case scenarios.

Senator Lieberman this morning, in the hearings on S. 816, said that Congress should err on the side of public health. In other words, they should minimize the risk to the public. We heartily concur.

Wishing doesn't make the trash go away. The trash comes in every day.

East Coast cities have begun to ship millions of tons per year as far west as Ohio—over 1,000 miles round trip in many cases. Two million tons a year is coming to Ohio from New Jersey. Ohio's landfills are now filling rapidly. We may have as little as 6 years left in Ohio for Ohio waste. And, unfortunately, long-distance

transportation of waste to landfills in the interior of the United States may place the general public at far greater risk than municipal waste combustion facilities.

In our opinion, right now the health and welfare of the East Coast population itself is more at risk from increased trucking—I'm referring to traffic accidents—than it would be from the necessary new combustors. I'm not just talking about air pollution, either.

Air pollution from trucking is orders of magnitude worse than it is from incineration. The exhaust alone from the trash transfer trucks in use at the present time poses a greater hazard to the environment than emissions from the necessary incinerators.

Just as an example, the World Health Organization has determined that 90 percent of the world's ambient dioxin comes from cars and trucks. Very little of the other 10 percent comes from incinerators. Trucking is far worse than incineration with regard to air pollution.

But, in addition to exhaust concerns, there is the likelihood of serious injury or death from traffic accidents resulting from the huge increases in truck traffic. Accident statistics from the Department of Transportation's 1986 statistics show that there is, in fact, on the average, 0.06 deaths from each million miles of interstate trucking. I can take that figure and show that the 2 million tons per year from New Jersey to Ohio has to be transported in 100,000 truckloads.

With 1,000 miles for the round trip, we have on the road right now 100 million miles a year of trash trucking just for that two million from New Jersey to Ohio. Using the Department of Transportation's statistic, that results in six extra deaths a year from the trucking—and 60 major injuries, too, by the way. And that doesn't even begin to consider the fact that 5 million tons are going from New Jersey to Pennsylvania. You can double the deaths.

If you consider the annual risk in New Jersey alone that results from this effort to get 7 million tons a year out of the State, you find that New Jersey has condemned itself to one additional death per year from trucking—just the accidents. Forget the air pollution.

Now, this morning we heard in the testimony that the order of risk for the industries we were discussing this morning are on the order of one additional cancer case per thousand over a 70-year period. Just to keep things in perspective with regard to incineration, those same sorts of risk assessments taken to their extreme have shown the possibility of an additional cancer per 70 years of one in one million—1,000 times less than the industries we were talking about this morning.

We strongly believe that a variety of options must be available to manage and dispose of the Nation's solid waste. In this regard, incineration is making an important contribution.

Senator BAUCUS. I'm going to have to ask you to summarize, please, Mr. Norton.

Mr. NORTON. I think I'll just let the statement that we have prepared and submitted stand on the record.

I will be glad to answer any questions you might have.

Senator BAUCUS. Thank you.

Senator BAUCUS. Our final witness this afternoon is Mr. Allen Hershkowitz.

**STATEMENT OF ALLEN HERSHKOWITZ, SENIOR SCIENTIST,
NATURAL RESOURCES DEFENSE COUNCIL**

Mr. HERSHKOWITZ. Thank you, Mr. Chairman.

I represent the Natural Resources Defense Council which, as you know, is a national environmental research and advocacy organization with over 130,000 members around the country and a professional staff of attorneys and scientists dedicated to protecting the public health and the environment.

We fully applaud the efforts contained in Senate bill 196 to finally address the necessity for Federal standards for municipal solid waste combustors. I would point out to you that there is already in existence or awarded 154,000 tons of capacity for burning municipal waste in approximately 194 facilities. According to estimates offered by Shearson-Lehman, that may be as much as half of all the necessary incinerator capacity this country needs. It is about time that the Federal Government is establishing national standards for air emissions for these facilities.

I'd like to make the following recommendations to modifying your bill—a good bill.

I would just add parenthetically that NRDC endorses the remarks of the Environmental Defense Fund with regard to the ash management.

The emissions of these facilities is essentially related to their planning. The planning of these facilities is essentially related to pollution control. For example, incinerators do not create heavy metal emissions; incinerators take the toxic metals in trash and make them more bio-available through combustion.

For this reason we'd like to point out that what is required is State plans targeting the proper disposal route for each category of waste. Each category of waste has its proper disposal route. Obviously, non-combustible material, which is routinely fed into used incinerators, should not be directed to incinerators. Why should communities throughout the country pay to have bottles and cans introduced into their furnace, only to have these materials, as glass and metals, wind up as contaminated ash which they then have to pay again to send to a landfill?

According to support documents offered by the U.S. EPA in its agenda for action, as much as 60 to 70 percent of all incinerator ash in the United States consists of glass and metals. For this reason we ask that, as a pre-requisite for the permitting of these facilities, State plans should require waste composition analysis being performed by each municipality and any jurisdiction, government, or authority considering the use of a waste-to-energy facility.

After the waste composition analysis is carried out, we're asking that the following materials be removed away from the waste stream directed towards an incinerator, because they should not properly be combusted: obviously, non-combustible materials should be directed away from incinerators—glass, ferrous and non-ferrous metals, and construction debris; and we're also asking that incinerator-toxic materials, including household batteries that con-

tain cadmium, lead, and mercury, and obviously automotive batteries—the greatest source of lead in municipal waste streams—as well as plastics containing toxic metals such as cadmium and lead, be directed away from the incinerator.

These materials are either non-combustible or contain incinerator-toxic material which will just increase the emissions of the facility and further strain the ability of the air pollution control equipment to achieve optimal removal efficiencies.

However, we are not asking then that the combustible fraction of the waste stream be routinely introduced into the furnace, but rather that the combustible fraction of the waste stream then be itself analyzed for its targeting to a proper disposal route. Obviously, newspapers and high-grade office papers that are eminently recyclable, for which there is a market with varying prices—some negative prices—can be directed away from the disposal route of the incinerator. Yard waste and food waste can be composted. HDPE and PET and all these combustible materials are, themselves, recyclable. These also should be directed away from the disposal route of the incinerator.

In this way you can rationalize the process of planning the incinerator and, I would add, also reduce the extraordinary conflicts that are now raging throughout the United States with regard to consumer opposition to these facilities because so many facilities are planned to introduce non-combustible material, incinerator-toxic material, or recyclable material into the combustion unit unnecessarily and at high cost to citizens.

I would just point out parenthetically that this proposal conforms with section 129(d) of your legislation, which states that “standards under this subsection shall be based on methods and technologies for removal or destruction of pollutants before, during, and after combustion.”

There is no question that source separation is the best available control technology for pollutants of concern.

Second, we ask that you tighten the emission requirements for particulates. Section 129(2)(b)(ii) of your bill should be tightened up to read 0.01 grains per dry standard cubic foot. Actual data from more than two dozen commercial operating facilities have confirmed that particulate emission rates considerably lower than that proposed in your bill are, in fact, routinely achievable. Moreover, permits issued in Maine, California, Illinois, and Virginia limit particulate emissions to that level, indicating that vendors can guarantee this achievable level of performance.

Third, the retrofit requirements in your bill—I guess I have to close.

Senator BAUCUS. Just summarize.

Mr. HERSHKOWITZ. We believe they are unacceptable. Six years to achieve more lenient emission standards are not at all defended by any health-based analysis. Six years is too long, and we can't understand why, if retrofit is going to occur, they can't meet the highest emission requirements.

We believe a dioxin emission limit is necessary. We would recommend that 0.1 nanograms per normal cubic meter, in line with the Swedish recommendations, be included.

And we also ask that you include mandating the training and certification of incinerator personnel. Unless you have good workers, it doesn't matter what kind of technology you employ.

These points are elaborated on in my testimony.

Thank you.

Senator BAUCUS. Thank you very much.

I appreciate the various statements you have all made suggesting how to essentially improve upon the bill. We will be taking all of those into consideration and working through all those statements.

But essentially and basically, am I correct in believing that each of you, even though you have some suggestions on how to improve upon the bill, would favor the bill as opposed to not favoring the bill?

Ms. TODD. We would certainly——

Senator BAUCUS. Then I'm going to ask each of you to give a one-sentence way how you'd modify it. But first, is there anyone here who, as it is written today, would advocate defeat of this bill?

Mr. NORTON. As it is written, I'd have to propose that it not be passed. It will close down——

Senator BAUCUS. That's all I asked.

Is there anyone else who, as written, would advocate that this bill not pass?

Mr. HERSHKOWITZ. So long as there is no provision properly targeting each category of waste to their proper disposal route, including combustion and recycling and source separation, we think the bill is deficient.

Senator BAUCUS. Deficient?

Mr. HERSHKOWITZ. Yes.

Senator BAUCUS. Let me turn it around. Does anybody think the bill, as written, should pass? I'm giving you a chance later on to indicate how you'd modify it, but if you were in our position, yes or no, final passage, is there anyone here who would—how many here would reluctantly vote yes?

How many would reluctantly vote no?

[Hands raised by Mr. Denison, Ms. Todd, Mr. Moore, Mr. Norton and Mr. Etter.]

Senator BAUCUS. As it stands. That's like the United States Congress.

Senator CHAFEE. How many would enthusiastically vote no?

Senator BAUCUS. I apologize for missing part of your testimony. I'm going to go down the table here. In a one-sentence modification, how would you improve upon it so that you would reluctantly, begrudgingly vote for it?

Mr. DENISON. Mr. Chairman, I think the area most needing strengthening is the standards for disposal of ash in facilities other than those that meet the basic design requirements, both during an interim period and once final standards are in place.

Senator BAUCUS. Thank you.

Ms. Todd.

Ms. TODD. I think you need to focus on environmental results as opposed to design specifics. There are two things. I would want to see you look at that particular aspect. And, secondly, on the liner provisions, looking at site specific considerations affecting perform-

ances and alternatives rather than just saying that this particular technology will solve it. Because, in our case, it would be counter-productive.

Senator BAUCUS. I hear you. Okay.

Mr. Etter.

Mr. ETTER. Mr. Chairman, there are trade-offs in environmental quality relative to the different types of waste management methods used in the integrated approach. Likewise, there are trade-offs relative to the different types of waste combustion technologies. And there are certain applications of waste combustion technology using modular systems that provide social benefits without sacrificing environmental quality. One that I might point out is the use of modular systems that have successfully destroyed PCBs with over 99.99999 percent destruction and removal efficiency.

There are useful applications of waste combustion if designed, operated, and maintained properly, technologies other than the one that this bill has been based on. That's not being critical of that technology, but pointing out that there are different applications where the bill needs flexibility. To provide proper waste disposal.

Senator BAUCUS. Okay.

Mayor Stallwood.

Mayor STALLWOOD. The area I think that we'd like to see acted upon as quickly as possible within the reauthorization of the Clean Air Act, and also the designation of incinerator ash—I think it is very important for the municipalities to be designated as special waste.

Senator BAUCUS. On this bill, though? What would you modify in this bill?

Mayor STALLWOOD. I'm not sure that we'd modify anything. I think what we're recommending is that within the area that we have mentioned in the particulates that you pointed out as 0.15 is a standard. If you put the standards in place, we need to be certain that they are in place for a number of years so that retrofits—lock in the retrofiting.

But just to make recommendation of changes, just that the standards be in place for a number of years.

Senator BAUCUS. Mr. Moore.

Mr. MOORE. I would, first of all, remove the broad-based planning requirements that I think are much more appropriately dealt with in RCRA reauthorization. And, with regard to the degree of specificity on the technical side, I think I would be less specific in the law setting the broad, minimum standards, broad guidelines, but leave the technical details to the Executive Branch.

Senator BAUCUS. Mr. Norton.

Mr. NORTON. Again, I laud the bill's repeated reference to the public's health and environment. Then you've got lines in there that say that we should keep adjusting the standards to match the lowest demonstrated control levels without relating that to whether or not it was really necessary to achieve that low a level to preserve the public health and welfare. These numbers you've got are way beyond what is really necessary to preserve the environment or public health.

We've got a plant we have run for 20 years with no problem—two plants. We just expanded them. The public in my area is happy with them. We have no demonstrated environmental negatives.

Senator BAUCUS. What about that, Mr. Hershkowitz?

Mr. HERSHKOWITZ. One sentence.

Senator BAUCUS. Let's see how creative you are.

Mr. HERSHKOWITZ. All noncombustible and reusable materials must be precluded from being introduced into the combustion unit in order to support achieving tighter emission standards, ash reduction, and ash detoxification.

Senator BAUCUS. What is your reaction to Mr. Norton's statement?

Mr. HERSHKOWITZ. Which point of Mr. Norton's statement?

Senator BAUCUS. Essentially that this is way too tight.

Mr. HERSHKOWITZ. I think it is clear from data derived by the Swedish Environmental Protection Board and USEPA that basically unless you have scrubbers and baghouses and well-trained operators and thermal deoxygenation equipment, you're not going to achieve the lowest achievable emission rates. You're not going to optimally protect the public health—especially in light of the absence of validated toxicological information which could specifically correlate particular emissions to particular target populations.

Risk assessments are fraught with data and methodological deficiencies, and using risk assessments to somehow predict cancer rates is ridiculous. The best thing that risk assessments can do is indicate to us how tight a control mechanism we might necessarily have to employ on a particular technology.

Senator BAUCUS. Thank you.

Senator Chafee.

Senator CHAFEE. Mr. Hershkowitz, aren't we liable to have a conflict between the recycling, which you stress so much—the source reduction, no cans, no glass—and the need for *x* amount of volume to go through the incinerators for the incinerators to be able to commercially survive?

Mr. HERSHKOWITZ. That's why we ask if that could happen. It is clear that with recycling or diversion away from incinerators it is possible that you have non-recyclable, non-combustible material which should also not go to incinerators. It is clear that unless you plan these facilities properly, you can construct a situation which unfortunately occurs too frequently in this country where necessary waste incineration competes with necessary recycling. That's why we're asking up front how you know how much land, capital, and labor to allocate to these facilities unless you know how much non-recyclable, non-combustible materials you want to burn. That's why we ask up front waste composition analysis indicating what you have, what's non-combustible, what can be economically and efficiently directed towards re-use paths; and then what's left over that is combustible, non-recyclable; and then you scale your facility. In that way, you avoid the ever present community opposition.

The reason that every plant is facing community opposition in the United States today is because citizens think this stuff is non-burnable or it can be recycled. If you put the planning process up front and say here's what we've got now and you have public hearings indicating—

Senator CHAFEE. I don't want to have you go on too long, but I think you're overly optimistic in thinking that you're going to eliminate all the opposition if you just tell them we're not going to burn any unnecessary things.

Mr. HERSHKOWITZ. I don't think you'll eliminate all the opposition. A lot of that has nothing to do with proper resource management. But there is a legitimate—there are valid reasons that community groups are stopping these projects. It is valid to stop these projects if you are going to introduce non-combustible material into a furnace. As a taxpayer in New York City, I don't want to pay to bring bottles and cans to a furnace and then pay again to bring those contaminated materials as metals and glass to a land fill. That's irresponsible of government.

Senator CHAFEE. Mr. Moore, the problem in our State—and I suppose it is typical—is that it is very, very difficult to cite these incinerators. I know Mr. Hershkowitz has the suggestion that the public will be mollified if you eliminate much of this, but we haven't seen that up our way. Do you have any comments?

Mr. MOORE. I would agree that people don't want these facilities. I would disagree as to what the reason is. People don't want any kind of trash disposal facility anywhere near them, whether it is a landfill, a transfer station, a recycling center—and it goes beyond that. How about prisons? Highways? Any big, major facility is oftentimes controversial in a local community. I have not—

Senator CHAFEE. You build it, and 20 years later there is a suggestion to close it. Then there's another up the road.

Mr. MOORE. That's right. Once you've got the dependence—and that's something that we are very concerned about.

If I could say one word about the compatibility of waste-to-energy with recycling, we have no quarrel with the notion of State planning. We are advocates of it. We think that whole issue needs to be addressed in a comprehensive way in RCRA reauthorization and not linked to a waste-to-energy facility. But recycling and waste-to-energy facilities are totally compatible. You pull out unburnables, that improves the fuel.

In Alexandria, there is a facility that burns all of the residential trash in Arlington and Alexandria. It has got metal and glass in it. It has also got such a high content of paper—an interesting statement on the Washington area—that the BTU content of the trash currently is right up at the maximum design capability. That fuel would be improved if you pulled the metal and the glass and some of the paper out of it.

The Japanese are the recycling masters of the industrialized world. They recycle, it is claimed, close to 50 percent of their trash. They are also the waste-to-energy masters. They have waste-to-energy that accounts for about 30 percent of their trash.

The two things can work together. It does require planning, but there are lots of adjustments downstream that can be made, and we think the planning requirements ought to be part of RCRA and not linked to simply one tool in the waste management menu.

Senator BAUCUS. Thank you.

Senator Durenberger.

Senator DURENBERGER. If somebody reads this record and they read the responses to the chairman's questions, they might get the

impression that none of you want any legislation at the national level in this area. Is there anybody here who says do not pass anything at the national level?

[No response.]

Senator DURENBERGER. Good. Let the record show that everybody here wants a bill passed that relates to a municipal incinerator.

Is it a fairly safe assumption that what I stated in my opening statement, one of the reasons you do is that right now it is pretty tough to either see somebody else or yourself have to make a commitment to multi-million dollar investments without knowing whether or not the rug is going to get pulled out from you at some time in the future? Is that a generally fair statement of the position of those of you that have some responsibility in this process? Though our disagreements are largely on—especially here at the left end of the table—on how to go about it and to what degree, we need to guarantee public health safety and what process we ought to use to get there. That's my impression of the disagreement here.

I have a question of Mr. Moore. What is the position of the association on the inclusion of waste reduction as a requirement in the NSBS that EPA will propose? Should BACT require the removal of some items from the waste stream?

Mr. MOORE. We don't quarrel with their objective; we just don't think that you get there on the road that they are trying to take.

What the EPA is considering is linking the granting of an air permit to source separation. You put the operator of the facility in the role of policeman, and you put the whole air permit, the whole facility, at risk.

If you are on the financing side of this kind of proposal and you look at the exposure that the facility has, you say, "We're not going to put up our money because you can't guarantee that no prohibited material is going to get into your trash. Your whole permit is at risk, and you might be shut down."

Senator DURENBERGER. I think I got your point. Thanks.

Ms. Todd, let me just say that I'll come down and look at your plant. My folks live in Clearwater.

Ms. TODD. Come in the winter.

Senator DURENBERGER. Yes. Right.

I always do. I never thought of looking at an incinerator, though, while I was there.

But I want to say one thing about your statement. We're not requiring scrubbers here because of SO₂ emissions because incinerators don't emit a lot of sulfur dioxide. The problem for us is metals and organics. And metals, as you probably know, and I'm just learning, vaporize in the combustion process and the scrubbing process brings the temperature down and the metals and some organics get precipitated out as particulates.

In fact, one of our witnesses here this morning, as I recall, when we were talking about the Great Lakes, mentioned the value of scrubber technology to capture mercury emissions from coal combustion. So I just wanted you to know that that's the reason.

And what you said about the problem in Florida, which I alluded to in my question of the Senator about the bubbling up containers, we will see that that gets taken care of in the alternative language. That's why that alternative language is there.

Mr. Etter, I need to ask you a question about hospital incinerators—and some of the biggest problems in the country right now are due to hospital incinerators and whether or not the average hospital, given everything that has gone on in this country, can afford incinerators and afford particulate control and afford scrubbers. If the answer is no, most of them can't, suppose we went to some kind of regional system for medical waste incinerations? Is that a good idea? What are the economics of that sort of thing, and how would you go about doing it?

Mr. ETTER. Well, the Waste Combustion Equipment Institute members supply equipment both to the commercial regional facilities, as well as the individual hospitals. In that regard, we see that there are areas where it does make sense to go to a regional facility. However, there are certain areas of the country, such as in areas out in the rural areas of Minnesota, for example, where that does not become a practical solution. Again, I'd like to defer to Mr. Norton's statement regarding the issue of trucking those wastes. At what distance is it practical to truck those wastes before it becomes an undesirable option?

What we're saying is that we feel that the options for both should exist.

Currently approximately two-thirds of the hospitals in the United States—7,000 health care institutions—use on-site incineration to help dispose of their waste. About 65 percent of the hospitals have less than 200 beds and are mostly rural facilities. The problem incinerators are a very small portion of the more than 4,500 systems that are currently in use. A major part of the problem has been the operation and maintenance of those systems. The Waste Combustion Equipment Institute is currently promoting—and has been successful in that regard—the development of an operator training and certification program under the ASME to help address these problems.

Senator DURENBERGER. Regardless of what the panel thinks of the bill, I'm really glad they were all here. I've learned a lot from their testimony.

Senator CHAFEE. I want to say the same, Mr. Chairman. I think it was an excellent panel. We appreciate the contribution every individual made.

Senator BAUCUS. That's right. And I think it is also important that you, Senator Durenberger, clarified that they all want some bill passed.

Thank you very much.

This hearing is adjourned.

[Whereupon, at 4:20 p.m., the subcommittee was adjourned, to reconvene at the call of the Chair.]

[Statements submitted for the record and the bill, S. 196, follow:]

1301 Pennsylvania Avenue NW
Washington, D.C.
20004
(202) 626-3000

President
Terry Goddard
Mayor, Phoenix, Arizona

First Vice President
Bob Boman
Mayor, Ft. Worth, Texas

Second Vice President
Sidney J. Barthelemy
Mayor, New Orleans, Louisiana

Immediate Past President
Fameila P. Plume
Councilor, Portland, Maine

Executive Director
Alan Bess

on behalf of
THE NATIONAL LEAGUE OF CITIES

S. 196

MUNICIPAL WASTE COMBUSTION CONTROL ACT OF 1989

before the

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

UNITED STATES SENATE

September 21, 1989

Past Presidents: Tom Bradley, Mayor, Los Angeles, California • Henry G. Cisneros, Mayor, San Antonio, Texas • Fred L. Harrison, Mayor, Stockton, Neth. Carolina • William H. Hudnut, III, Mayor, Indianapolis, Indiana • George Lottimes, Mayor, St. Paul, Minnesota • James M. Rattiner, Mayor, Newport News, Virginia • Cathy Reynolds, Councilwoman-at-Large, Denver, Colorado • John J. May, Mayor, Chicago, Illinois • Charles W. May, Mayor, Seattle, Washington • George V. Voinovich, Mayor, Cleveland, Ohio • Directors: Gary Anderson, Mayor, Decatur, Illinois • Jane Starnes, Mayor, San Mateo, California • Carolyn Long Banks, Councilmember, Atlanta, Georgia • Marjorie A. Beon, Mayor, Grand Haven, Michigan • Jesse E. Bourne, Jr., Mayor, North Charleston, South Carolina • Margaret W. Carpenter, Mayor, Thornton, Colorado • Stephen T. Casasno, Deputy Mayor, Manchester, Connecticut • John W. Proctor, Mayor, Overland Park, Kansas • Edward C. Farrell, Executive Director, New Hampshire, Councilmember, Indianapolis, Indiana • Joseph B. Gorman, Mayor, San Jose, California • Fred Guerra, Mayor Pro Tem, San Marcos, Texas • Stanley A. Anthony, Ed., Councilmember, Houston, Texas • Glenford W. Bassett, Mayor, Pro Tem, Orlando, Florida • Joe B. Jackson, Mayor, Murfreesboro, Tennessee • Peter Kling, Executive Director, League of Iowa Municipalities • Mike D. Lindberg, Mayor, Portland, Oregon • Gary Merrimans, Executive Director, Missouri Municipal League • Melissa Peterson, Alderwoman, Alameda County, California • William J. Quinn, Mayor, Oklahoma Municipal League • David D. Ott, Alderman, Chicago, Illinois • David E. Reynolds, Executive Director, Maryland League of Municipalities • John W. Rodriguez, Councilman, Yuma, Arizona • Perry R. Smith, Mayor, San Francisco, California • James Scheibel, Council President, St. Paul, Minnesota • Florence Shapiro, Mayor Pro Tem, Plano, Texas • Dolores Silbonga, Councilmember, Seattle, Washington • S.B. Turner, Councilman, Lumberton, North Carolina

Mr. Chairman, members of the Subcommittee: I am Burton Stallwood, Town Administrator of Lincoln, Rhode Island and Chairman of the National League of Cities' Energy, Environment and Natural Resources Committee. I am here today to testify on S. 196 for NLC and the 16,000 cities and towns across the nation we represent.

I believe this committee is well aware of the major problem facing our nation's cities and towns in arranging for the disposal of municipal solid waste. What we at the local level confront is, in effect, a moratorium on the construction of waste disposal systems, be they state-of-the-art sanitary landfills or incinerators and ash disposal facilities.

Opposition from local citizenry -- understandable and in some cases legitimate -- concerned about the safety, the esthetics, and the impact on property values militates against the ability of local governments to deal effectively with our solid waste. What is rarely, if ever, factored into this opposition is the potential consequences of having no disposal options available to local governments -- the potential for the ultimate threat to human health and the environment.

We believe the time has come for federal intervention in addressing some of the more pressing health and safety questions to enable municipalities to move forward with appropriate, environmentally sound options for dealing with solid waste. It is clear, that significant parts of the country cannot sustain a viable solid waste program in the presence of continued local opposition and federal inaction in this area.

- 2 -

Given the likelihood that we will see action on a Clean Air Act reauthorization proposal in the 101st Congress, we would urge you to use this opportunity to clarify and regularize the parameters for municipal waste combustion facilities -- both incinerators and ash disposal facilities.

In reviewing S. 196, we regard the measure as a significant improvement over similar provisions incorporated in S. 1894, considered by this committee in the 100th Congress. That is not to say it could not be improved further, and, I am here to express our willingness to work with you and your staff toward that end.

We have several basic requirements that must be addressed in federal legislation:

1. **CERTAINTY** -- as the committee knows, there are over 200 municipal waste combustion facilities currently planned or under construction. We have an urgent need for standards as quickly as possible to insure that we are protecting our citizens and at the same time not squandering scarce local resources;

2. **RATIONAL REQUIREMENTS THAT REFLECT WHAT CAN ACTUALLY BE ACCOMPLISHED** given the variability of the municipal waste stream;

3. **ADEQUATE COMPLIANCE TIME;**

4. **FEDERAL ASSISTANCE IN REDUCING AND/OR ELIMINATING TOXICS FROM THE MUNICIPAL WASTE STREAM;** and

5. **DESIGNATION OF INCINERATOR ASH AS A "SPECIAL" WASTE;**

6. adequate provisions to permit recycling of municipal incinerator ash; and
7. protection from retroactive liability.

1. Our need right now is for certainty. Municipalities across the country are attempting to deal with their own particular solid waste disposal crisis by investing substantial local resources in the construction of incinerators and ash disposal facilities. We cannot afford -- either from the financial perspective, or more importantly, from the perspective of assuring our citizens that these necessary facilities are safe -- to find these investments inadequate after the fact. We need to know, and we need to know now, what standards and criteria must be included in these facilities -- both to protect the public health and safety, and to enable municipalities to site and build these facilities.

2. We have reservations about the incinerator emission limitations proposed in S. 196. While the experts tell us these numbers can be achieved, they also tell us they cannot be achieved continuously given the variability of the municipal solid waste stream. We would like to work closely with your committee in conjunction with the technical experts in developing standards protective of health and the environment while at the same time ensuring that whatever standards are finally agreed upon are achievable in real world situations.

3. Any legislation dealing with either incinerators or ash disposal facilities must recognize that existing municipal solid waste disposal practices cannot be changed overnight. While the construction of an ash disposal facility could conceivably be completed in five or six months, this does not take into account the need to site, to finance, or to permit a new facility.

When developing retrofit or closure mandates, you must keep in mind that we have garbage every day and that we must do something with it in the interim. Suggesting that we take it to an existing facility that meets the new criteria during the interim is not necessarily a viable option.

As elected officials, we are keenly aware of potential liability concerns. If there is an existing facility that meets federal criteria in another political subdivision, you may not assume they will be willing to take another local government's wastes, even for the short term.

You may assume that many cities will also be reluctant to transport their wastes outside of their boundaries because of the ever-present threat of future designation as the "potentially responsible party" should that facility at some point appear on the National Priorities List.

4. Source reduction is another area where we believe federal intervention is essential. We do not believe either state or local governments can successfully mandate the exclusion of specific product constituents.

Municipalities can have only a limited impact on how products are packaged, toxic constituents in products, or the volume of products that are "disposable." We are constrained in these efforts not only by interstate commerce protections, but also by local economics.

Under most circumstances local ordinances can effectively reach and affect only local businesses. We can adopt ordinances prohibiting the use of lead in newsprint, but its application will be limited to our local newspaper. We cannot apply such ordinances to newspaper printed outside of our jurisdiction nor can we ban the importation of out-of-town newspapers printed with lead-based ink.

Similarly, while we might be able to ban or limit the use of toxic constituents in products manufactured within our boundaries, cities and towns are not inclined to place local manufacturers at a competitive disadvantage with manufacturers of similar products made outside of our jurisdiction.

The biases and constraints that make source reduction unworkable at the state and local level are far less problematical at the federal level. For one, federal laws have the advantage of establishing uniformity nationwide. Second, national initiatives to minimize wastes don't run afoul of interstate commerce protections. And finally, national source reduction initiatives create a level playing field -- everyone has to comply and no one is put at an economic disadvantage vis a vis a competitor.

It would also seem from industry's perspective that they would rather deal with one set of federal requirements than have to tailor their products to meet the requirements of 50 different state laws and thousands of variations of municipal ordinances.

We certainly appreciate the recognition in S. 196, that neither source reduction nor recycling are Best Available Control Technology. We understand that EPA is giving serious consideration to proposing removal of certain items from the waste stream as BACT for purposes of securing an incinerator permit. We are not convinced the agency recognizes that the impact of such a decision would be to foreclose incineration as an option for disposal of municipal solid waste. No local government can make any such "guarantee" and without that "guarantee" no funding will ever be available for construction of an incinerator.

Let me assure you that municipalities across the country are enthusiastically pursuing recycling initiatives. Nevertheless, we are concerned about the need for the development of markets for these goods. Here again, we believe federal intervention, such as mandates for federal agencies and sub-contractors to use recycled products, will ensure that cities and towns do not end up with warehouses filled with unrecycled recyclables.

5. It is certainly our impression that there is much disagreement and uncertainty not only about the hazardous nature of municipal incinerator ash and its leachability, but also the appropriateness of the current test available to determine toxicity. EPA has determined that only Congress can resolve the issue of whether incinerator ash is a "hazardous" waste and must therefore be disposed of in a Subtitle C facility or a "nonhazardous" waste appropriate for disposal in a Subtitle D facility.

While the merits of that argument are best left to those with scientific expertise, from the municipal perspective we would prefer for ash to be classified as a "special" waste under Subtitle D, with appropriate federal parameters for its proper disposal. So long as incinerator ash is perceived to be "hazardous," no ash disposal facility will ever be sited, let alone built. Designation of ash as a "special" waste, accompanied by a federally-approved protocol for the disposal facility should facilitate our ability to move forward with incineration as an option for disposal of municipal solid waste.

6. NLC supports the development of new and appropriate testing and treatment requirements for municipal incinerator ash. We also believe it is necessary to provide for flexibility in disposal practices for ash which passes any new and appropriate toxicity test or which is treated in accordance with new federal requirements.

We would hope that the federal government would make a sufficient investment in research to facilitate the recycling of municipal incinerator ash in a manner that is protective of human health and the environment.

7. Mr. Chairman, I would also like to take this opportunity to pose a question to you and members of the committee on liability issues. While I don't expect an answer now, it is something we think you need to consider.

There is increasing frustration among local elected officials at the double-edged sword federal legislation so frequently presents to us.

On the one hand, the federal government imposes stringent, costly environmental mandates on local governments. In most cases, these mandates have a sound basis and while we may mutter about their necessity and their costs, however grudgingly, we comply.

But overall, it seems to us, the federal government has the best of both worlds. You impose requirements on us, and then hold us strictly, jointly and severally liable if they don't work. From our viewpoint, they are, after all, your requirements -- you developed them, enacted them and see to it they are implemented. If your requirements don't work, shouldn't you also take some responsibility for that?

- 9 -

I wish to restate, Mr. Chairman, that the National League of Cities looks forward to continuing to work with you and the committee on this and other important Clean Air Act issues as Congress moves forward with legislation. I would also like to request that our National Municipal Policy on resource recovery be included as part of the record.

Thank you for the opportunity to share our views with you.

National Municipal Policy

1989

Adopted at the
Annual Business Session
Congress of Cities
Boston, Massachusetts
December 7, 1988

National League of Cities
1301 Pennsylvania Avenue, N.W.
Washington, D.C. 20004
(202) 626-3000

2.04 Solid and Hazardous Waste

A. Problems

The disposal of wastes and the conservation of resources are two of the most challenging problems to be solved by this nation. With almost half of our cities running out of current disposal capacity in the next two to three years, America's urban areas face an immediate disposal crisis.

Additionally, the improper disposal of hazardous waste and the spills of chemicals, oils, and other hazardous substances as the result of highway, rail and waterway accidents are national problems which can endanger public health and pollute our nation's air, water and land resources. A solution to the hazardous waste and materials problem will require the cooperation of federal, state and local governments as well as the hazardous waste generating industries and materials transporting industries.

B. Goals

The crisis of solid waste management must be solved through an aggressive program of source reduction, volume reduction, resource recovery, and ultimate disposal all of which must be compatible with the environment.

A national hazardous wastes and materials management strategy must be developed in order to protect human health and the environment. The strategy should encompass the entire life of the waste and material, from reproduction to transportation and temporary storage to final disposition.

C. National Solid Waste Policy

A national policy for solid waste management should take an integrated approach to effectively mix and match management options to best meet local needs.

To assist city officials' efforts to effectively address this crisis, the federal government must support the following management options.

1. Source Reduction

The federal government should support public education programs to enhance a better understanding of the crisis and to promote public participation in options to reduce the volume of solid waste. Federal packaging standards should be established for manufacturers, distributors and retailers to achieve maximum feasible reduction. Congress should enact legislation which will identify and remove from the waste stream packaging and products which are toxic and not recyclable and/or biodegradable. Federal

regulations should require that all new disposable products and all advertising mail be non-toxic, recyclable and/or biodegradable. Federal resources should support research and development on packaging materials and techniques to minimize solid waste.

2. Recycling

The federal government must initiate and implement a recycling and reuse program for all federal agencies and government contractors. Federal funding should support research and development and pilot programs to assist localities in the demonstration of new recycling techniques. In addition, federal and state governments should provide tax assistance to identify and develop markets for recycled materials. Further, the federal government must restore favorable tax policies for recycling processing centers. The federal government should also enact mandatory deposits on beverage containers, batteries and tires. Any national recycling goals if established must take into account economic and regional market variations. Federal resources should fund research and development of beneficial reuse of municipal incinerator ash and sewage sludge, and for tires and glass as rubberized asphalt glassphalt or other products.

3. Resource Recovery

Federal legislation and regulatory action must address environmental concerns about resource recovery and the disposal of incinerator ash.

Specifically, the federal government must provide that the term of permits for new incinerators be for an adequate duration, or at least 20 years with periodic monitoring to ensure compliance with permit conditions. EPA should promptly promulgate regulations for municipal incinerators under the Clean Air Act, including new source performance standards under Section 111(b) of the Clean Air Act. In addition, retrofitting should be limited to significant pollution problems unknown at the time the permit was issued, and should be determined on a site specific basis as provided in Section 111(d) of the Clean Air Act. Reasonable time frames for retrofitting should be established and emission control requirements should be established which are achievable given the diverse nature of the municipal solid waste stream. The federal government must restore favorable tax policies for the financing of resource recovery facilities and support the avoided costs mandate of PURPA. The federal government should also assist in the development of appropriate siting criteria and develop training and certification programs for operators of municipal incinerators.

The federal government should exempt resource recovery facilities from any construction ban under the Clean Air Act. Federal regulations should establish reasonable emissions monitoring requirements.

For incinerator ash, the federal government should designate it as a "special" waste under Subtitle D of the Resource Conservation and Recovery Act and establish new and appropriate testing and treatment requirements. No federal law or regulation which presumes that ash from resource recovery plants is toxic should be adopted or be-

come effective unless and until Congress and EPA have scientific evidence of such toxicity. Federal regulations should provide for flexibility in disposal practices for ash which passes the new test or which is treated in accordance with new federal regulations. The federal government should also establish minimum design criteria for ash monofills, which protect human health and the environment for disposal of ash which is not treated, or tested, or which fails toxicity or other applicable test.

4. Landfills

The federal government must restore favorable tax policies for financing landfills. The federal government should also assist in the development of appropriate siting criteria and provide assistance to local governments in developing community outreach programs to explain the necessity for landfills.

New federal or state mandates reclassifying specific segments of waste retroactively, thus requiring new and more costly disposal methods and/or retrofitting of existing and closed disposal facilities, must be accompanied by financing to comply with these new requirements.

D. Nuclear Waste Management Policies

1. Local Participation in Site Selection

The Nuclear Waste Policy Act should be amended to give local governments authority to directly participate in the site selection process for high level nuclear waste repositories. Further, sufficient technical assistance funding from the Nuclear Waste Trust Fund should be provided to localities to enable them to conduct technical studies of potential repository sites, to provide technical comments on federal siting-related documents, and to monitor the site selection process.

2. Monitored Retrievable Storage Systems

Congress should authorize and the federal government should proceed with construction of a monitored retrievable storage facility designed to be an integral component of the overall nuclear waste management system. Temporary storage capacity of the system should be limited to 15,000 metric tons. The MRS facility should not operate until the federal government authorizes construction of the first repository.

3. Cask Testing

Full scale testing of any prototype containers and equipment used for the transportation of high level radioactive waste should be required by the federal government.

4. Routing

Local governments should be consulted in the designation of routes for the transportation of high level radioactive waste and spent fuel through their jurisdictions. Where state governments seek the designation of alternative routing to the Interstate system, they should be required by federal law to create a review and comment process that provides affected local jurisdictions with the opportunity to participate in the alternative routing decision.

TESTIMONY BY COMMISSIONER BARBARA SHEEN TODD OF PINELLAS COUNTY
FLORIDA TO THE ENVIRONMENTAL PROTECTION SUBCOMMITTEE OF THE SENATE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SEPTEMBER 21, 1989, WASHINGTON, D.C.

GOOD AFTERNOON MISTER CHAIRMAN AND SENATORS. I AM BARBARA SHEEN
TODD, COUNTY COMMISSIONER FROM PINELLAS COUNTY FLORIDA. I WOULD
LIKE TO THANK YOU FOR THIS OPPORTUNITY TO TESTIFY BEFORE YOU TODAY
ON THIS PROPOSED LEGISLATION, WHICH IS OF CRITICAL IMPORTANCE TO US
IN FLORIDA.

MISTER CHAIRMAN, I WOULD ALSO LIKE TO REQUEST, SINCE WE WERE CALLED
HERE ON SOMEWHAT SHORT NOTICE, THAT YOU DIRECT THE RECORD FOR THIS
HEARING TO BE HELD OPEN FOR AT LEAST TWO WEEKS TO GIVE US TIME TO
PREPARE AND SUBMIT FULL WRITTEN TESTIMONY ON THIS LEGISLATION.

BEFORE I BEGIN TO ADDRESS THE SPECIFICS OF SENATE I96, I WANT TO SAY
THAT THE PINELLAS COUNTY COMMISSION STRONGLY SUPPORTS YOUR EFFORTS
TO PASS CLEAN AIR LEGISLATION IN THIS CONGRESS, AND THAT WE
APPRECIATE THE DIFFICULTY OF THAT TASK.

I HOPE YOU WILL CONSIDER OUR TESTIMONY ON SENATE I96 IN THAT LIGHT.
AS AN URBAN COUNTY NOW MORE THAN SIX YEARS INTO THE OPERATION OF A
HIGHLY SUCCESSFUL WASTE-TO-ENERGY FACILITY, WE HAVE A GREAT DEAL AT
STAKE IN THIS LEGISLATION, AND FOR THAT REASON, WE ARE PARTICULARLY
PLEASED THAT YOU HAVE ASKED US HERE TO CONTINUE WORKING WITH YOU FOR
THE PASSAGE OF RESPONSIBLE MUNICIPAL INCINERATOR LEGISLATION.

PINELLAS COUNTY IS A SMALL PENINSULA JUTTING OUT INTO THE GULF OF MEXICO ABOUT MID-WAY DOWN ON FLORIDA'S WEST COAST. WE ARE SURROUNDED ON THREE SIDES BY THE BEAUTIFUL WATERS OF THE GULF OF MEXICO AND TAMPA BAY. IN SIZE, WE ARE THE SMALLEST COUNTY IN THE STATE OF FLORIDA. BUT, WITH A POPULATION OF 850,000 RESIDENTS, AND WITH 24 INCORPORATED MUNICIPALITIES, WE ARE TOTALLY URBANIZED---IN FACT, THE MOST DENSELY POPULATED COUNTY IN FLORIDA.

IF YOU CAN PICTURE WHAT I JUST DESCRIBED TO YOU, IT MAY HELP YOU TO UNDERSTAND THAT, IN PROTECTING THE FRAGILE ENVIRONMENT OF OUR LOVELY LITTLE PENINSULA, WE ARE FACED WITH SOME VERY BIG CONSTRAINTS AND CHALLENGES.

WE ARE JUSTIFIABLY PROUD OF THE WAY WE HAVE MET THESE CHALLENGES, AND I WANT TO SHARE WITH YOU TODAY WHAT WE CONSIDER TO BE OUR BIGGEST ENVIRONMENTAL SUCCESS STORY. THAT IS OUR SOLID WASTE MANAGEMENT SYSTEM.

RECOGNIZING THAT WITH OUR VERY SCARCE LAND AREA WE WOULD NEED AN IMMEDIATE ALTERNATIVE TO LANDFILLING OUR SOLID WASTE, WE TURNED TO RESOURCE RECOVERY, AND TO RECYCLING. IN PINELLAS, WE ARE RECYCLING ABOUT 18% OF OUR WASTE STREAM NOW; AND THE STATE OF FLORIDA HAS MANDATED A GOAL OF 30% RECYCLING BY 1994 FOR ALL COUNTIES IN FLORIDA.

PINELLAS COUNTY OPTED IN 1980 TO CONSTRUCT A RESOURCE RECOVERY FACILITY ON A 730-ACRE TRACT LOCATED IN THE CENTER OF OUR COUNTY.

IN 1983, THE PINELLAS WASTE-TO-ENERGY PLANT BEGAN OPERATION, THE LARGEST SUCH FACILITY IN THE WORLD. WITH A CURRENT BURNING CAPACITY OF 3,150 TONS PER DAY, OUR PLANT HAS BEEN AND CONTINUES TO BE, AN ENVIRONMENTAL "SHOWCASE"; AN ENVIRONMENTAL SOLUTION THAT ATTRACTS VISITORS FROM ALL OVER THE WORLD, NOT ONLY BECAUSE OF ITS SIZE, BUT ALSO BECAUSE OF ITS EXCELLENT ENVIRONMENTAL PERFORMANCE.

THE WASTE THAT IS NOT RECYCLED PRIOR TO DISPOSAL COMES EXCLUSIVELY TO OUR SOLID WASTE FACILITY. USING ELECTROSTATIC PRECIPITATORS IN 3 BURNERS, OUR MASS BURN TECHNOLOGY REDUCES THE VOLUME OF WASTE THAT MUST BE LANDFILLED BY ABOUT 85%. IN THIS PROCESS, OUR FACILITY USES GARBAGE AS FUEL, TO PRODUCE 75 MEGAWATTS OF ELECTRICITY---ENOUGH TO PROVIDE POWER TO 40,000 HOMES.

AND I WANT TO ESPECIALLY EMPHASIZE TO YOU TODAY, THAT THE EMISSIONS FROM THE PINELLAS PLANT ARE NOT THE "DOWN-SIDE" OF THIS SUCCESS STORY! ON THE CONTRARY, I WOULD ASK TO ENTER INTO THE RECORD, AS A SUPPLEMENT TO MY TESTIMONY, A COPY OF THE HEALTH RISK ASSESSMENT STUDY WHICH WAS PERFORMED ON OUR FACILITY IN 1987. USING ACTUAL MEASURED EMISSION RATES, NOT ASSUMED EMISSION RATES, THIS REPORT CONCLUDES THAT HEALTH RISKS TO THE PUBLIC ARE INSIGNIFICANT. THE REPORT HAS BEEN WIDELY DISTRIBUTED FOR REVIEW AND COMMENT, INCLUDING THREE REGULATORY AGENCIES: THE NATIONAL EPA, THE FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION, AND THE STATE OF CALIFORNIA AIR RESOURCES BOARD. THE REPORT HAS NOT BEEN DISPUTED OR CHALLENGED IN THE TWO YEARS THAT HAVE ELAPSED SINCE ITS DISTRIBUTION.

HAVING GIVEN YOU THAT MUCH BACKGROUND ON OUR OWN PLANT, PLEASE LET ME DIGRESS TO SAY THAT WE ARE NOT ALONE. FLORIDA HAS BEEN A PIONEER IN SUCH ENVIRONMENTALLY OUTSTANDING WASTE-TO-ENERGY FACILITIES, AS SENATOR GRAHAM IS SO WELL AWARE. DURING HIS TENURE AS GOVERNOR OF OUR STATE, HE SUPPORTED THIS TECHNOLOGY, RECOGNIZING ITS ROLE IN THE PROTECTION OF FLORIDA'S AQUIFER. OUR NEIGHBORING COUNTY, HILLSBOROUGH COUNTY, AND THE CITY OF TAMPA LYING JUST ACROSS TAMPA BAY FROM PINELLAS, HAVE BOTH WORKED WITH US, AS HAVE OUR SISTER COUNTIES PARTICULARLY BROWARD AND PASCO, ON THE LEGISLATION THAT YOU ARE CONSIDERING TODAY. THE SPECIFIC CONCERNS THAT I BRING TO YOU TODAY ARE SHARED BY THEM; AND I AM SURE THEY WILL BE PROVIDING WRITTEN COMMENTS TO YOU, AS WE WILL, BEFORE THE RECORD IS CLOSED.

TODAY, I AM EXTENDING AN INVITATION, ON BEHALF OF THE BOARD OF COUNTY COMMISSIONERS OF PINELLAS COUNTY, TO EACH MEMBER OF THIS COMMITTEE, AND TO YOUR STAFF, TO COME TO PINELLAS AND VISIT OUR WASTE-TO-ENERGY PLANT. I HOPE YOU WILL CONSIDER THIS INVITATION. MR. CHAIRMAN, AND IF YOUR SCHEDULE PERMITS, HONOR US BY ACCEPTING.

OF COURSE, SENATOR GRAHAM HAS VISITED OUR PLANT. BACK IN 1985 HE SPENT A WORK DAY THERE WITH US; SO HE IS VERY FAMILIAR WITH OUR OPERATION.

SENATE BILL I96, IN MANY RESPECTS, REPRESENTS A REASONABLE APPROACH TO THE REGULATION OF INCINERATOR EMISSIONS AND ASH; AND TO THAT EXTENT, WE SUPPORT IT.

THERE ARE PRINCIPALLY TWO AREAS IN THE BILL THAT CAUSE US SERIOUS CONCERN; THEY RELATE TO 1) SCRUBBERS (THE REQUIREMENT FOR US TO RETROFIT OUR FACILITY WITH ACID GAS SCRUBBERS), AND 2) ASH DISPOSAL.

FIRST, WITH RESPECT TO SCRUBBERS:

WE STRONGLY FEEL THAT MODERN WASTE-TO-ENERGY FACILITIES THAT ARE MEETING ALL THE APPLICABLE PERFORMANCE STANDARDS SHOULD NOT BE REQUIRED TO CHANGE TECHNOLOGY JUST BECAUSE IT IS AVAILABLE. "CHASING" NEW TECHNOLOGY IS NOT ONLY PROHIBITIVELY EXPENSIVE, IT IS CLEARLY A FRIVOLOUS AND IRRESPONSIBLE VIOLATION OF THE PUBLIC TRUST UNLESS THERE IS SOME REAL ENVIRONMENTAL BENEFIT TO BE GAINED.

IN OUR PARTICULAR SITUATION, THE REQUIREMENT TO RETROFIT OUR PLANT WITH ACID GAS SCRUBBERS IS NOT JUSTIFIED BY ANY SCIENTIFIC OR TECHNICAL DATA THAT SHOWS ANY NEED TO CORRECT AN EMISSIONS PROBLEM. IN FACT, IN THE TAMPA BAY METROPOLITAN AREA, WHERE THERE ARE 3 RESOURCE RECOVERY FACILITIES (OURS, TAMPA'S AND HILLSBOROUGH'S) THE COMBINED EMISSIONS FROM ALL 3 FACILITIES CONTRIBUTE LESS THAN 1% OF THE SULPHUR DIOXIDE PRESENT IN THE ATMOSPHERE. WE WOULD RESPECTFULLY SUGGEST TO THE COMMITTEE THAT THE FOSSIL-FUEL POWER INDUSTRY, WHO EMIT NEARLY 95% OF ALL ACID GAS, BE ADDRESSED BY THE ACT. THAT INDUSTRY HAS THE LUXURY OF IDLE POWER PLANTS FOR REDUNDEANCY AND, IN GENERAL, HAS NOT PROVIDED GAS SCRUBBERS. UNLIKE THAT INDUSTRY, OUR WASTE-TO-ENERGY PLANT DOES NOT HAVE EXTRA BURNERS

FOR REDUNDANCY. IF WE RETROFIT, WE HAVE TO SHUT DOWN EACH OF OUR 3 BURNERS FOR A FULL YEAR, AND LANDFILL THAT GARBAGE INSTEAD OF BURNING IT. LANDFILLS ARE AN EMISSION SOURCE. THIS COMMITTEE NEEDS TO UNDERSTAND THE ENVIRONMENTAL TRADE-OFF INVOLVED HERE. THE BENEFITS DERIVED BY RETROFITTING DO NOT, IN OUR OPINION, JUSTIFY THE ADDITIONAL AIR EMISSIONS THAT RESULT FROM LANDFILLING AN EXTRA YEAR'S GARBAGE. THERE IS NO NET ENVIRONMENTAL BENEFIT. ALSO, IT CAUSES US TO USE UP PRECIOUS LANDFILL SPACE NEEDLESSLY. AND ALL OF THESE NEGATIVES ARE IN ADDITION TO THE COST, WHICH YOU KNOW HAS BEEN ESTIMATED AT AROUND \$15 MILLION PER UNIT ON AN AVERAGE. IN PINELLAS, OUR TECHNICAL CONSULTANTS HAVE ADVISED US THAT IN OUR SITUATION, RETROFIT COSTS WILL APPROACH \$100 MILLION.

IN ADDITION, THERE IS A PROVISION IN THIS BILL FOR EMISSION STANDARDS TO BE REVISITED EVERY 5 YEARS. WE WANT TO POINT OUT THAT THIS WOULD MAKE IT VIRTUALLY IMPOSSIBLE TO FINANCE THESE FACILITIES. SINCE OUR BONDS TYPICALLY ARE BASED ON A 20 YEAR AMORTIZATION PERIOD.

NEXT, WITH RESPECT TO ASH DISPOSAL:

OUR PROBLEM WITH THIS SECTION ON ASH DISPOSAL IS THAT IN PINELLAS COUNTY, WE "CO-FILL"---OUR ASH GOES INTO OUR LANDFILL WITH OTHER MATERIAL. THE BILL CALLS FOR 2 OR MORE COMPOSITE LINERS IN A CO-FILL SITUATION. SINCE IT IS TECHNICALLY IMPOSSIBLE FOR US TO PUT ANY TYPE OF LINER IN THE GROUND, (IT WOULD SIMPLY "POP UP" BECAUSE OF OUR HIGH WATER TABLE), THE

ALTERNATIVE DESIGN SECTION IS ABSOLUTELY NECESSARY FOR US. IT PROVIDES THAT WE CAN USE A ALTERNATIVE DESIGN IF WE CAN DEMONSTRATE OUR DESIGN WILL PREVENT LEACHATE MIGRATION AT LEAST AS EFFECTIVELY AS THE DESIGN REQUIREMENTS SET FORTH IN THE PRECEDING SECTIONS. BECAUSE OF OUR TRULY UNIQUE ENVIRONMENTAL CIRCUMSTANCES IN PINELLAS COUNTY FLORIDA, WE STRONGLY SUPPORT THE ALTERNATIVE DESIGN LANGUAGE THAT APPEARS ON PAGE 30 (SECTION 3(B)(4)). HOWEVER, THIS SECTION MAY BE EFFECTIVELY NULLIFIED FOR US BY THE REQUIREMENT FOR "2 OR MORE" COMPOSITE LINERS IN THE PRECEDING SECTION. OUR ALTERNATIVE DESIGN MEETS ALL THE PERMEABILITY STANDARDS, I.E., PERFORMANCE STANDARDS FOR LEACHATE. BUT THE DESIGN THAT WE WOULD BE REQUIRED TO DEMONSTRATE EQUIVALENCY TO IS UNREASONABLY OVER-PROTECTIVE, CALLING FOR "2 OR MORE" COMPOSITE LINERS. TECHNICAL EVIDENCE SHOWS THAT A SINGLE COMPOSITE LINER IS TOTALLY ADEQUATE. BY DEPARTING FROM PERFORMANCE STANDARDS AND PRESCRIBING DESIGN STANDARDS, YOU ARE OVER-REGULATING IN THIS AREA, AND WE BELIEVE, POSSIBLY RULING OUT OUR ALTERNATIVE DESIGN, WHICH WE KNOW TO BE ENVIRONMENTALLY SUPERIOR. RATHER THAN GO INTO A TECHNICAL DISCUSSION OF OUR ALTERNATIVE DESIGN, WE WILL PROVIDE THAT INFORMATION IN WRITTEN TESTIMONY.

I HAVE GREATLY CONDENSED OUR TESTIMONY ON THE TECHNICAL POINTS OF SENATE BILL I96 BECAUSE I WANTED TO CONCLUDE BY MAKING TWO VERY IMPORTANT POINTS:

THE FUNDAMENTAL FLAW UNDERLYING THE PROBLEMS WE HAVE IDENTIFIED IN THIS BILL WITH RESPECT TO SCRUBBERS AND TO ASH DISPOSAL IS THE DEPARTURE FROM PERFORMANCE STANDARDS AND THE SUBSTITUTION OF DESIGN STANDARDS. IT IS OUR OPINION THAT THE LEGISLATION WOULD BE SIGNIFICANTLY STRENGTHENED IF THE ENVIRONMENTAL RESULTS YOU ARE SEEKING WERE EXPRESSED AS PERFORMANCE STANDARDS THAT WE MUST ACHIEVE. THE IMPOSITION OF SPECIFIC DESIGN REQUIREMENTS IS COUNTER-PRODUCTIVE FOR TWO REASONS: 1) FREQUENTLY THESE DESIGN REQUIREMENTS ARE TECHNICALLY IMPOSSIBLE TO ACHIEVE AND 2) THE ENVIRONMENTAL RESULT OFTEN WILL FALL SHORT OF WHAT WOULD BE ACHIEVED THROUGH THE EXISTING PERMIT PROCESS WHICH TAKES INTO ACCOUNT ALL THE SITE-SPECIFIC CONSIDERATIONS AFFECTING PERFORMANCE.

IN CONCLUSION, THE FINAL THOUGHT I WOULD LEAVE WITH YOU IS THIS:

ENVIRONMENTAL LEGISLATION IS ONLY EFFECTIVE IF IT CAN BE MADE TO WORK BY THE PEOPLE WHO HAVE THE FRONT-LINE RESPONSIBILITY TO DELIVER THE SERVICES AND THE ENVIRONMENTAL SOLUTIONS. THAT RESPONSIBILITY RESTS WITH LOCAL GOVERNMENT. WE HAVE DONE A REMARKABLY GOOD JOB OF IT IN FLORIDA, AND WE HAVE INVESTED LITERALLY BILLIONS OF DOLLARS LOCALLY TO DO IT. PLEASE REMEMBER THAT CLEANING UP THE AIR AND PROTECTING THE GROUNDWATER IS AS MUCH OUR CONCERN AS IT IS YOURS. AGAIN, THANK YOU FOR THIS OPPORTUNITY TO OFFER OUR INSIGHTS ON SENATE I96.

ENVIRONMENTAL DEFENSE FUND

1616 P Street, NW
Washington, DC 20036
(202) 387-3500

TESTIMONY OF
THE ENVIRONMENTAL DEFENSE FUND

BEFORE THE

SENATE COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION

REGARDING

S. 196
"THE MUNICIPAL WASTE COMBUSTION CONTROL ACT OF 1989"

September 21, 1989

National Headquarters

257 Park Avenue South
New York, NY 10010
(212) 505-2100

1405 Arapahoe Avenue
Boulder, CO 80302
(303) 440-4901

5655 College Avenue
Oakland, CA 94618
(415) 658-8008

1108 East Main Street
Richmond, VA 23219
(804) 780-1297

128 East Hargett Street
Raleigh, NC 27601
(919) 821-7793

Richard A. Denison, Ph.D.
Senior Scientist

I. Introduction

I am Dr. Richard Denison, a senior scientist with the Environmental Defense Fund (EDF). Now in its 21st year, EDF is a national environmental research, education, and advocacy organization with over 100,000 members in all 50 states and 85 professional staff in 6 offices. EDF seeks to promote economically and environmentally sound waste management alternatives, including waste reduction, reuse, and recycling, and to assure that solid waste management does not create a threat to public health and the environment.

EDF has been actively involved in addressing the serious potential hazards posed by the incineration of municipal solid waste (MSW). EDF scientists, economists, and attorneys have appeared frequently before local, state, and federal legislative committees, testified in permitting hearings for individual facilities, commented on the development of state incinerator regulations, and conducted extensive research on the chemical composition and hazards of ash. EDF is also the plaintiff in two pending lawsuits against individual incinerators that allege that ash handling practices violate federal hazardous waste requirements. EDF has appeared frequently before Congress to address the issue of public health and environmental hazards of MSW incineration.

EDF continues to support the efforts by the Subcommittee to address this important issue. We believe that Senate Bill 196 embodies much of the legislative framework needed to implement a protective regulatory regime for managing MSW incineration.

My testimony today will focus primarily on one of the two major areas covered by S. 196: incinerator ash management. I will first describe the critical need to properly manage the rapidly growing quantities of ash generated across the country, which frequently pose unacceptable hazards to health and the environment because of the absence of any substantive federal requirements and an at-best threadbare patchwork of state regulations. I will then discuss several of the remaining areas where we see a need to strengthen the provisions of S. 196 in order to accomplish its clear objective of providing for proper management of MSW incineration.

II. Risks Posed by Ash Mismanagement

Incinerator ash mismanagement can pose major health and environmental threats. The last two years has witnessed a growing list of instances of grossly improper storage, transportation, and disposal of this material, which contains toxic levels of lead, cadmium, and other hazardous substances. A scant two miles from this hearing room, ash from the District of Columbia's incinerator is dumped into low-lying areas on the grounds of St. Elizabeth's Hospital, next to the Anacostia River. Run-off from the uncovered ash drains directly into the river. Access to the site, which is immediately adjacent to a residential neighborhood, is unrestricted. Hedges that line Pomeroy Street (until recently the entryway to the dumpsite) are covered with ash that leaked from dumptrucks used to transport the wet ash.

Another egregious case of environmental contamination from an ash monofill has recently been uncovered. Recent environmental sampling at an ash monofill in Bellingham, Washington documents the seriousness of the hazards posed by improper ash management. Testing conducted by EPA Region 10 late last year found greatly elevated levels of several metals in groundwater as well as nearby surface waters and sediments surrounding the ash disposal site. For example, all eight downgradient groundwater wells showed levels of cadmium that exceeded the drinking water standard by many-fold: the average level was almost 70 times the drinking water standard, with levels ranging as high as 133 times the standard.^{1/}

III. Requirements of Any New Legislation for Ash Management

Given the nature of the exposures that can result from ash mismanagement, EDF cannot overstate the importance of providing comprehensive controls over all phases of ash management in crafting any new legislative or regulatory scheme. Indeed, perhaps no other waste better illustrates the need for cradle-to-grave management than does incinerator ash, given its potential for dispersal or release to the environment not only through disposal, but during

1. See Phase 1 Sampling Summary Report for Thermal Reduction Company, Whatcom County, WA, prepared by Ecology and Environment, Inc. for Superfund Section, EPA Region 10, Seattle, WA, February 1989.

in-plant handling, storage, transportation, treatment, and post-closure as well.

One of the potential pitfalls that must be avoided in creating a new regulatory class of wastes through legislation -- as S. 196 would do for incinerator ash -- is the omission of vital portions of the carefully crafted and intricate (some might argue tangled) hazardous waste regulatory scheme. Any new scheme must provide not only technical controls, but also: (1) administrative requirements for closure and post-closure care, monitoring and testing, recordkeeping and reporting, financial responsibility, etc. that ensure protection of human health and the environment; (2) strong legal authorities for the Administrator and states to undertake appropriate inspections and enforcement actions, to assess civil penalties, to require corrective action, etc.; and (3) full opportunity for public review and comment and for citizen enforcement. The apparent need to "solve" an immediate crisis cannot be allowed to override the real need of ensuring full protection of occupational and public health and the environment.

IV. Necessary Elements in the Design of Ash Disposal Sites

In EDF's view, incinerator ash should be disposed of only in monofills equipped with, at a minimum, double liners, leachate collection, and leak detection. These monofills should employ a phased filling operation, in which small cells are filled in a sequential manner so as to minimize the active life of any individual cell to a maximum of 12-18 months. Final cover for each cell should include both synthetic and compacted soil components. Each of these design and operational elements is the minimum necessary for optimal functioning of the containment system over the long term, and as such should not be compromised.

A detailed discussion of the need for each of these elements is provided in Appendix 1. Several of the more salient features are discussed below and are compared and contrasted with the provisions of S. 196. References and cost information are also provided in Appendix 1, which document the cost-effectiveness of the design proposed by EDF. In fact, by several estimates, the increase in the cost to a typical resident to add all of

these protections to an unlined site amounts to less than \$1 per year. Relative to the requirements in S. 196, the cost increment is even less.

Monofilling: Even since consideration of this legislation during the last session of Congress, a much stronger international consensus has emerged that there is a clear preference for exclusive use of monofills for ash disposal. Based on all available data, monofills provide a much more stable and predictable disposal environment than co-disposal of ash along with other wastes. The governments of Sweden, the Netherlands, and Canada have all adopted regulations or guidelines that require or strongly recommend exclusive use of monofills for incinerator ash. Swedish and Canadian officials also recommend separate management of fly and bottom ash, at least to the point of pre-treatment of the fly ash prior to combining it with bottom ash.

In this country, a dozen states have adopted or proposed legislation or regulations for ash management in the absence of action by the federal government. All but two of these states would require exclusive use of monofills for ash disposal. Those states requiring or proposing monofills are: Connecticut, Maine, Massachusetts, Michigan, Minnesota, New Jersey, Ohio, Oregon, Pennsylvania, and Washington.

Given this experience, EDF cannot support the provision of S. 196 that would allow for co-disposal of ash along with unburned MSW, even in facilities meeting a more stringent design standard as proposed. We do view as acceptable the development of monocells within existing landfill facilities, so long as those monocells are separately lined and have their own leachate collection and leak detection systems, and are not vertical expansions^{2/} of MSW landfills. Allowing for this configuration should alleviate some municipalities' concerns over the burden of siting entirely separate facilities for ash and MSW.

At the very least, S. 196 should provide EPA with full authority to require ash monofilling, separate management of fly and bottom ash, and ash treatment prior to both monofilling and co-disposal.

2. Section 4011 (c) of S. 196 would restrict the use of vertical expansions; this language should be amended to account for the loss of integrity that settling could induce not only in liners, but also leachate collection and leak detection systems, final cover, and any other structural components of the landfill containment system.

Double liners and double leachate collection: As EPA has acknowledged on countless occasions, "even the best liner and leachate collection systems will ultimately fail due to natural deterioration" (53 Fed. Reg. 33345, August 30, 1988). Double liners have been demonstrated to provide far better containment than single liners.^{3/} Double liners also allow installation of two systems for collecting leachate: one above and the other between the liners. The upper system collects the great majority of leachate, preventing it from ever reaching the lower liner, which serves as the ultimate barrier from the environment. The lower system provides two critical advantages: (1) any leachate that escapes through the first liner can be detected, thus providing a system of immediate leak detection for the upper liner and allowing corrective or mitigatory action to be taken; (2) any such leachate can be collected so that it does not build up on the lower liner.

The instances of ground and surface water contamination from ash disposal sites discussed earlier highlight the need for full, long-term containment of ash leachate. EDF considers it unacceptable to sanction a landfill design that relies on groundwater contamination as the exclusive means of leak detection -- precisely what the provision of S. 196 allowing a single composite liner for ash monofills would do. All opportunities for corrective

3. The advantages of composite liners over synthetic or compacted soil liners alone has been well documented (see Appendix 1), and is acknowledged in S. 196. However, subsection (b)(2) needs to be amended to provide somewhat more specificity in defining the term "composite liner." We suggest the following additional language (underlined), which has already been used by EPA in other contexts:

"... the term 'composite liner' means a liner which consists of a a minimum 60-mil thickness of high density polyethylene or equivalent material, and at least a 3-foot thick layer of recompacted clay or other natural material with a hydraulic conductivity of no more than 1×10^{-7} centimeter per second."

Appropriately, subsection (b)(2) requires prevention of migration "into" such liners. In other contexts, Congress has also required that liners employing synthetic materials prevent any migration into the liner. See RCRA Section 3004(o)(5)(B). However, subsection (b)(3)(A) would only require no migration "into and through" the composite liner. To be consistent with subsection (b)(2) and other RCRA provisions, the words "and through" should be struck.

action or mitigation are lost in a system where leaks are detected only after they have escaped the disposal site and have reached groundwater.

Final cover: Final cover is a critical element in the containment capability of a landfill because -- if properly designed, installed, and maintained -- it can greatly reduce the amount of precipitation entering the landfill, and therefore the amount of leachate collecting at the bottom. It is essential that the final cover be at least as impervious as are the liners; otherwise there is long-term potential for buildup of liquid inside the unit (the so-called "bathtub effect") following the eventual failure of leachate collection. For this reason and others discussed in Appendix 1, at a minimum, the use of a composite cover should be required for all disposal sites. Such a provision is not presently included in S. 196, and should be added to subsection (h).^{4/}

Limited monofill cell active life: As discussed in Appendix 1, EDF believes that all disposal sites should employ a phased filling operation, in which small cells are filled sequentially and capped as a means to further minimize leachate generation. The active life of such cells should be limited to 12-18 months.

Waiver for an alternative design: While EDF recognizes that there are circumstances under which an alternative design should be permitted, we consider these circumstances to be extremely rare, and therefore that a substantial burden of demonstrating equivalent protection of groundwater and surface water must rest on the applicant. A formal determination by the state or Administrator of the adequacy of such demonstration should also be required. Most importantly, in all cases such a determination must be preceded by full opportunity for public review and comment.

4. We suggest the following language be added to subsection (h):

"Upon closure, facilities used to dispose of ash from municipal waste incineration units shall utilize a final composite cover system designed, operated, and constructed of materials to prevent the infiltration of precipitation into such cover during any closure or post-closure monitoring period. For purposes of this section, the term 'composite cover' means a cover which consists of a minimum 40-mil thickness of high-density polyethylene or equivalent material, and at least 2-foot thick layer of recompacted clay or other natural material with a hydraulic conductivity of no more than 1×10^{-7} centimeter per second."

There are several serious deficiencies with subsection (b)(4), which authorizes such waivers. First, a demonstration of equivalence of the alternative design could include consideration of "operating practices." This is unacceptable to EDF, because of the lack of any effective means of guaranteeing that such operating practices will be used consistently. For example, an assurance -- even in a permit -- that daily or intermediate cover will be used to reduce infiltration of precipitation into the disposal site may or may not actually be adhered to. EDF is aware of many instances where such permit requirements have been consistently or repeatedly violated. We cannot support linking adequate protection of groundwater to a tenuous set of intended operating practices, the actual implementation of which is heavily dependent upon the very limited inspection and enforcement resources and authorities of regulatory agencies. Only legitimate locational characteristics and the actual alternative design should be considered in waiver determinations.

Second, as presently drafted, subsection (b)(4) would apparently allow alternative designs to be approved by a state prior to the Administrator's approval of the state's program to implement and enforce the provisions of this section, as required under subsection (i). Until such approval, states should not be allowed to approve alternative designs.^{5/}

We are also concerned over the use of the undefined term "hazardous constituent" in this section. Indeed, the alternative design should be capable of containing any constituent of the ash. Some of these constituents (e.g., salts or certain metals) may not necessarily be hazardous to human health, but may pose hazards to the environment or may be early indicators of the release of hazardous constituents. In addition, the alternative design should be capable of containing the ash itself. For these reasons, "any hazardous constituent" should be supplemented with "ash or any of its constituents."

5. We therefore recommend that the following language be added to subsection (b)(4):

"States may authorize such alternative design requirements only under a permit program approved by the Administrator as required under subsection (i) of this section."

Authority to require a more stringent design or additional controls:

As presently drafted, the authority of the Administrator to require more stringent requirements is limited to ash monofills (subsection (b)(3)(C)). If this legislation continues to allow for co-disposal of ash in MSW landfills, such authority should be extended to these disposal sites as well.

Circumstances where a more stringent design or additional controls are warranted may arise, due, for example, to the sensitivity of the location of a particular facility. The Administrator or states should have full authority and a responsibility to require additional design or operational elements in such cases, regardless of whether ash is monofilled or co-disposed.^{6/}

Case-by-case variance from compliance with the design standards 4 years after enactment: EDF opposes subsection (1)(4), which would allow substandard ash disposal sites to continue operating for an additional two years upon certain showings. We believe that strict adherence to the 4-year deadline is necessary to halt, as soon as feasible, the continued co-disposal of ash with MSW in inadequately designed facilities. Only a clear and firm deadline measured from the date enactment of this legislation will provide sufficient momentum in that direction. Subsection (1)(4) should be deleted in its entirety.

V. Requirements for Ash Disposal in Sanitary Landfills

Subsection (c) would allow ash to be disposed of in sanitary landfills if such ash passes applicable tests and if fly ash has first been treated and also passes the tests. The ability of currently available short-term test

6. As presently drafted, S. 196 requires leak detection systems only for co-disposal sites, and does not limit active cell life for any ash disposal facilities. At the very least, EPA should be mandated to consider the need for such additional controls when developing disposal regulations, and thus the following language should be added to subsection (b)(3)(C), as amended above:

"In promulgating regulations under this subsection, the Administrator shall consider factors including but not limited to: (a) establishing limitations on the length of the active life of an ash disposal facility or a unit within such a facility as a means of reducing leachate production; and (2) the need and potential options for incorporating leak detection and/or collection into the design of ash disposal facilities, if not otherwise required."

procedures to predict the long-term leaching behavior of ash is very limited. Recently available information only reinforces these shortcomings. A growing number of studies indicate that certain metals -- particularly lead -- present in ash may continue to leach over long periods of time, and that relatively slow chemical changes in an ash disposal environment can occur which dramatically affect leaching of metals.

For these reasons, the provisions of S. 196 that would allow for disposal of ash in sanitary landfills must assure that such sites only receive ash which is clearly demonstrated not to pose short or long-term risks. The requirement that fly ash be treated prior to such disposal is a prudent step in this regard. It is critical, however, that EPA develops and fully validates testing and treatment methods capable of addressing long-term leaching potential.

As drafted, this subsection has several deficiencies. Sanitary landfills authorized to accept ash must have at least one liner, leachate collection, and groundwater monitoring, and must meet the requirements of revised criteria promulgated under section 4010 (c). EDF supports these requirements, but believes that additional restrictions are necessary. S. 196 should specify that such landfills must also have:

- * dust emission controls, surface water controls, and run-on and run-off controls, including daily and intermediate cover requirements;
- * access restrictions to the landfill during the entire period that the landfill remains in operation, and during closure and post-closure periods;
- * a program of groundwater monitoring approved by the Administrator or the State;

In addition, S. 196 should expressly prohibit the disposal of ash in any landfill from which the Administrator or the State has determined there is or has been a release into groundwater or surface water, or any landfill that is in violation of EPA's or the State's regulations or other requirements (including requirements in the facility's operating permit) governing releases from the facility into groundwater or surface water.

During the interim period between 18 months after enactment of this section and the effective date of regulations, subsection (1)(2) would authorize sanitary landfill disposal of ash in facilities having at least one

liner, leachate collection, and groundwater monitoring. While EDF supports such a contingency, it is critical that the same additional restrictions specified above apply to these interim-use sites as well. Subsection (1)(2) should therefore be amended to explicitly include these additional requirements.

VI. Recycling and Reuse of Ash

Subsection (d) of S. 196 would authorize the utilization of ash, if such ash is treated first and routinely passes applicable tests to be developed by the Administrator.

As increasingly stringent regulations governing ash disposal are developed, interest is rapidly growing in developing "beneficial" utilization of ash. It is critical to ensure that the risk considerations that have led to more stringent regulation of ash disposal are not neglected in assessing the potential for ash utilization. Indeed, because ash utilization (e.g., in roadbuilding or construction activities) allows the placing of ash or ash-derived products into the general environment, rather than a controlled disposal environment, this activity involves potential exposures that extend well beyond those from ash disposal, both in magnitude and duration. Moreover, our ability for long-term control over ash or for remedial action is lost in most utilization applications, raising the threshold for demonstrating safety. In the absence of sufficient demonstration of safety, ash utilization may only postpone rather than eliminate exposures.

The dispersive nature of ash utilization highlights the need for considering all plausible routes and time frames for exposure to utilized ash. Yet for many of these, the tools needed for such an evaluation are simply not yet developed; for example, there is no procedure for measuring -- let alone any actual data on -- the rate of erosion or dusting from a cement surface under various conditions. This property may be of little concern for ordinary cement, which does not have an appreciable toxic metals content; it is of major concern for cement formed using ash as a substitute aggregate.

Research into the feasibility of ash utilization has only just begun to address environmental and public health concerns. In EDF's view, considerable additional research will be needed to provide a sufficient basis for

determining whether full-scale ash utilization can be conducted safely, and if so, for what applications and under what conditions. In addition, full-scale ash utilization must be preceded by thorough environmental testing and the development of a comprehensive regulatory program.

Ash Treatment^{7/}: There is still considerable uncertainty about the long-term effectiveness of various proposed ash treatment processes. Several treatment methods commonly used for other wastes have recently been applied to ash, with very different results. For example, in a recent study, ash treated by addition of cement was found initially to release very little lead, but after a short period the lead released dramatically increased and remained high. Similarly, treatment by addition of lime to ash -- a method of treatment being proposed or actually used by several existing incinerators -- has been found in several cases to dramatically increase the leaching of lead from the ash, even using ordinary water. Ironically, these methods may allow the ash to pass the EP toxicity test, but would actually increase the likelihood of leaching in the real world.^{8/}

7. The definition of treatment in subsection (a)(2)(B) is generally an excellent one, but in one respect poses an unreasonable burden upon EPA. It would apply only to those constituents of ash which would pose a threat to human health or the environment. The entire premise of RCRA is to reduce the potential for harm to occur, and therefore to manage wastes that may pose a present or potential hazard to human health or the environment. See RCRA Sections 1004(5) and 7002(a)(1)(B). The word "would" should therefore be replaced with "could" or "may".

8. As drafted, Section (d)(2) does not explicitly require treated or untreated ash from a particular facility to pass the testing procedures prior to being recycled or reused, only that the levels or methods of treatment specified in the regulations be capable of producing ash that passes the tests. EDF proposes therefore to replace subsections (d)(2)(B) and (C) with the following:

"(B) assure that the recycling and reuse of such ash are protective of human health and the environment, which shall, at a minimum, require that all ash to be recycled or reused, and all products made from such ash, satisfy applicable criteria and routine testing procedures promulgated under paragraph (1)."

Given that some promising approaches to ash treatment actually reduce the metal content of the ash itself, rather than attempting to fix the metals in
(footnote continued on next page)

EDF cannot support reduced requirements for the containment of treated ash unless and until: (1) ash treatment methods have been developed and validated, and quality assurance/quality control requirements have been developed; (2) specific treatment standards are established; and (3) a full regulatory and permit program for such ash treatment has been implemented.

Once testing procedures have been identified by the Administrator, subsection (e)(3) has the potential to allow ash to be utilized even it leaches toxic substances at levels up to 100 times their maximum contaminant levels, or MCLs (see subsection (e)(1)). This is the same maximum standard set for ash to be disposed of in sanitary landfills, which would represent a far more controlled environment than would likely be the case for ash being utilized in the general environment. Even more ironically, this standard is 100-fold less stringent than that which would be applicable, under subsection (d)(3), if EPA failed to promulgate any ash utilization regulations.

EDF believes that this represents a serious deficiency in S. 196 as drafted. While we support a maximum leaching level of 100 times MCLs for ash to be disposed of in sanitary landfills, a much more stringent standard -- one at or approaching the MCLs themselves -- should apply to ash to be utilized. Direct exposure of the reused ash to the elements and to people must be assumed to be plausible, if not likely. Certainly it would represent a reasonable worst-case scenario. Therefore, no "safety factor" is warranted.

Interim Recycling and Reuse: Section (d)(3) would allow ash utilization in the absence of any regulations if it is treated and leaches certain metals at levels no greater than drinking water standards. Such a standard would serve to reduce the universe of ash qualifying for utilization during the interim period before regulations are promulgated. However, many of the most serious public health and environmental concerns related to

(footnote continued from last page)
the ash, subsection (d)(2)(A) should be amended to read as follows (new text underlined):

"(A) substantially diminish the toxicity of the ash or substantially reduce the likelihood of migration of ash or its hazardous constituents so that short-term and long-term threats to human health and the environment are minimized."

placing ash -- even treated ash -- into the general environment would remain entirely unaddressed by sole reliance on a leaching test. For example, the potential for direct contact with the ash, which is greatly enhanced in many reuse scenarios, would be left entirely unaccounted for under this provision of S. 196.

For these reasons, EDF believes that ash utilization should be expressly prohibited during any interim period, and only allowed once testing procedures, treatment standards, and regulatory controls are developed and implemented by the Administrator. Subsection (d)(3) should therefore be amended to read as follows:

"Until the Administrator promulgates regulations under this subsection, no person may reuse or recycle ash from a municipal waste incineration unit."

VII. Ash Management Capacity Demonstration

Senate Bill 196 allows four options for ash management:

- 1) landfill with double composite liners (subsection (b)(1));
- 2) monofill with single composite liner (subsection (b)(3));
- 3) sanitary landfill with one liner, leachate collection, and groundwater monitoring, if the ash passes applicable tests and any fly ash has been treated and also passes the tests (subsection (c));
- 4) reuse or recycling if the ash has been treated and passes applicable tests (subsection (d)).

It is critical to proper implementation of incineration as an option for MSW management that incinerator construction be directly linked to development of adequate ash management capacity. Under no circumstances should a situation be allowed to develop in which an incinerator commences operating without capacity for ash management that complies with applicable standards. In addition to prohibiting such operation, the only practical means of assuring that such capacity will be available is to require a demonstration of such capacity, for a period of at least 5 years, as a prerequisite for obtaining a permit to construct the incinerator. This is critical, since once a facility is constructed, there is tremendous economic and political pressure to allow its operation even in the absence of proper ash management. Lack of attention to this problem has resulted in numerous instances around the country of financial loss and substandard ash management.

S. 196 addresses this problem by requiring permit and renewal applications to include a "reasonable demonstration of adequate capacity to treat, manage, or dispose" of the ash for a period of at least 5 years. EDF strongly supports this provision, but believes that it needs several modifications to be feasible and effective.

First, the bill would allow the demonstration of capacity to apply to management of ash by any of the four means, listed above. The problem is that options 3 and 4 require that ash to be so managed pass tests (either initially or following treatment) -- something which cannot be demonstrated in advance of the promulgation of tests/treatment standards nor in advance of actual ash generation. In the absence of ash to be tested, the bill would allow the capacity demonstration to be based on data from another facility "of comparable design."

Unfortunately, the character of ash even from similarly designed facilities can vary dramatically as a result of differences in the composition of the input waste, thus rendering such data unreliable. Thus, any assumption that ash will pass the tests is unfounded. Allowing a capacity demonstration to be based on an assumption that ash would pass would frustrate the entire purpose of the capacity demonstration, since obviously no provision would have been made for disposal capacity for ash that failed.

This appears to limit any "acceptable" demonstration for options 3 or 4 to demonstrating an ability to treat the ash so that it passes the tests. There are currently no proven treatment technologies for ash, although they will likely be developed. Until they are, however, and until treatment regulations and their associated testing procedures are final, no adequate demonstration of treatment capacity is even possible, and therefore this option should not be permitted.

As an alternative approach EDF proposes that the capacity demonstration requirements distinguish between three different types of facilities:

1) all facilities before regulations are promulgated: A capacity demonstration for all facilities seeking permits to construct or operating permit renewals after the date of enactment should be required. Capacity would have to be demonstrated for either option 1 or 2; options 3 and 4 are precluded because regulations specifying testing, treatment, and reuse do not yet exist.

2) operating facilities seeking renewals after regulations are promulgated: For this group, all four categories would be open, since these facilities are generating ash which could be tested directly or treated and then tested to provide a basis for demonstrating that the ash is suitable for disposal in a sanitary landfill or for reuse under the regulations.

3) new facilities seeking permits to construct after regulations are promulgated: This group would be eligible for options 1 and 2. However, they would not yet be generating ash, and any presumption that the ash would pass is unwarranted, given existing data as well as the variability of ash from facility to facility. Thus, basing a demonstration on a presumption of being able to "test out" and then utilize options 3 or 4 must be precluded.

However, it may be that EPA will have developed treatment regulations that specify methods that can be demonstrated to successfully treat ash despite its variability among facilities or from certain types of facilities. In this event, demonstrating a capacity to treat the ash using EPA approved methods, and then to dispose of the ash in a sanitary landfill or to reuse the ash in compliance with subsections 4011(c) and (d), could be allowed.

Subsection (b)(2)(A) requires ash management plans to be submitted as a prerequisite for issuance of a permit to an incinerator. It should further be required that such plan be approved by the Administrator or the state before a permit may be issued.

Subsection (b)(2)(B) authorizes but does not require the Administrator to issue regulations requiring ash testing as part of the capacity demonstration. Capacity demonstrations for options 3 and 4 must be based on ash testing; therefore, either the Administrator must be required to issue such regulations, or capacity demonstrations for options 3 and 4 should not be allowed unless and until such regulations are issued.

VIII. Acceptable and Unacceptable Wastes

The characteristics of ash are in large measure a function of the components of the wastes fed to an incinerator. Some waste materials (e.g., batteries, metal-containing plastics) directly contribute to ash toxicity. Other materials (e.g., yard wastes and non-combustible items such as cans and bottles) provide no advantage to the incinerator, may well reduce its efficiency, can be composted or recycled, and, in any event, increase the volume of ash. Waste input is thus an obvious regulatory handle for controlling the toxicity and volume of ash, as well as more generally encouraging sensible waste management. Waste input is also an important

(though not sole) determinant of the composition and toxicity of incinerator air emissions.

S. 196 contains several provisions that are pertinent to this issue. Subsection (j)(1) of Section 4011 requires jurisdictions served by municipal waste incineration units to prepare an enforceable solid waste management plan that would require ("to the extent practicable"): (1) prohibitions on disposal of certain items in MSW to be incinerated; and (2) separation of certain toxic materials from MSW prior to incineration. Subsection (m) of Section 129 would require the Administrator to identify materials that may pose risks when incinerated and then specify further requirements to control such risks.^{9/}

EDF strongly supports these legislative mandates to control waste input to incinerators. An additional legislative approach to this issue deserves serious consideration as well: a requirement to consider the potential benefits of source separation and recycling as part of "best available control technology" (BACT) for MSW incinerators.

In EDF's view, BACT analysis for an incinerator should include consideration of source separation and recycling measures which may reduce the quantity and enhance the quality of emissions. A growing body of operating data confirm what common sense suggests -- that "conditioning" the wastestream to be incinerated can improve the performance of incinerators and reduces their impacts on air quality. Source separation and recycling programs can be instrumental in two ways. First, they remove noncombustibles such as glass and aluminum from the wastestream. Noncombustibles can increase incinerator emissions by reducing incinerator efficiency; they also increase the amount of residual ash, which is itself all too often an air pollution source as a result of fugitive emissions. Second, source separation and recycling can remove materials such as yard wastes and batteries that directly contribute to emissions of regulated pollutants when incinerated.

Treating recycling as an "available control technology" is wholly consistent with -- indeed, it is required by -- the Clean Air Act. BACT

9. Subsection (m)(6) authorizes the Administrator to specify "requirements for the disposal of such product or article or its residues." We support this provision, but suggest that it explicitly authorize the Administrator to prohibit the incineration of certain materials if necessary to protect human health and the environment.

review is comprehensive, extending to all "available methods, systems, and techniques," specifically including "fuel cleaning or treatment." 42 U.S.C. 7479(3). Controlling incinerator input through source separation and recycling clearly qualifies as "fuel cleaning."

From a broader policy perspective, it is essential that incineration not be implemented in a manner that precludes careful consideration of the contribution that strategies such as source separation and recycling can make both to reducing the quantity of waste and to increasing the safety and efficiency of waste management.

IX. Occupational Safety Issues

In addition to the threats to the health and environment of the general public that may be posed by improper handling of ash, there are particular concerns about the public health threats for workers at municipal incinerators, as well as for personnel who transport or dispose of ash. The significant public health problems that may arise are graphically demonstrated by recent events at the brand new Detroit incinerator, the world's largest municipal incinerator, with a capacity to burn 4000 tons per day of trash. Earlier this year, while the incinerator was conducting trial burns, two groups of workers walked out on strike with complaints that the ash was making them sick. Subsequently, the Michigan Department of Health (MDOH) cited the operator of the incinerator for unacceptable exposure of the workers to lead in ash, and violations of numerous occupational health requirements. The MDOH inspection found that ash was dispersed throughout the facility, including in the workers' lunchroom, and that some workers had been exposed to lead in ash at nine times in excess of the Michigan and federal Occupational Safety and Health Standards of 50 micrograms per cubic meter of air. (See Appendix 2.)* EDF suspects that similar circumstances exist at many other municipal incinerators, demonstrating the need for stringent handling of this material.

Any legislation governing municipal incinerator ash must assure stringent protection for the workers who may be exposed to incinerator ash or its constituents. Thus, it is essential that protections now or soon to be applicable to wastes designated as hazardous apply to the handling of ash. For example, under the Superfund Amendments and Reauthorization Act of 1986

*Appendix 2 has been retained in committee files.

(SARA), P. L. No. 99 - 499, the Department of Labor must set standards for the health and safety protection of workers engaged in "hazardous waste operations." SARA Section 126, codified at 29 U.S.C. Section 655 (note). Under these provisions, the Secretary of Labor has published an interim final rule, 51 Fed. Reg. 45654 (December 19, 1986), codified at 29 C.F.R. 1910.120, and a final rule that will become effective in March, 1990. See 54 Fed. Reg. 9294 (March 6, 1989).

Provisions that apply to RCRA hazardous waste facilities by virtue of such provisions, or other provisions for worker training or protection that are included in the hazardous waste regulatory program, must also apply to facilities handling incinerator ash. See also section 7001(f) of RCRA, 42 U.S.C. section 6971(f). Under S. 196 as now drafted, none of these protections would be extended to workers -- those at highest risk from improper ash management.

X. Enforcement Issues

It is essential that any bill governing MSW ash provide the tools needed for state and federal agencies as well as citizens to effectively enforce the law. Such authorities need to be as broad as those available under Subtitle C of RCRA. The bill contains several deficiencies in this regard, some of which are discussed below.

Subsection (a)(1) and (m)(2) authorize the Administrator to use the enforcement authorities of RCRA Section 3008 to enforce the requirements of this section. It should be made clear that the "requirements of this section" include orders, regulations, standards, permits, and conditions that have become effective pursuant to this section. Additionally, in order to enable the Administrator to fully use such authorities, certain terms contained in 3008 should be defined to make clear that all of the 3008 enforcement tools are available under this section. For example, the following language should be added to subsection (m): "For purposes of this section and section 3008, the term 'hazardous wastes' shall be deemed to include any hazardous constituent, MSW incinerator ash, or any of its constituents, and the phrase 'facility authorized to operate under section 3005(e)' shall be deemed to

include any facility regulated or authorized to operate under this section."

Corrective action is an important part of the RCRA Subtitle C program. Subsection (g)(3) of S. 196 requires corrective action regulations. Such provisions are, however, less specific than some of the enforcement provisions of Subtitle C regarding corrective action. With the changes proposed in the preceding paragraph, the Administrator should be able to use the enforcement provisions of 3008(h) to issue corrective action orders at facilities regulated under this section. Such authority is essential, as is corrective action for any facility regulated under this section as may be necessary to protect human health and the environment.

The provisions of section 3013 of RCRA, 42 U.S.C. section 6934, provide the Administrator of EPA with important authority to require a facility to conduct monitoring, analysis, testing, and reporting to determine the nature and extent of a hazard to human health or the environment that may exist. Such information gathering provisions are important tools for the Agency and authorized states to have at their disposal. Such provisions should be included in S. 196, and could be incorporated by adding them to and expanding the scope of subsection (a)(1) to include the authorities of 3013 as well as the ability to obtain information and access under RCRA Section 3007. Additionally, the authorities of sections 3007 and 3013 should be applicable not only to the MSW ash itself, but also to any constituent of such ash.

XI. State Program Authorization Issues

It is critical that states have in place a program for ash management that is equivalent to and no less stringent than the federal program, not only with respect to substantive standards but also with respect to enforcement. The process by which EPA approves state programs must assure that the provisions of the federal program will apply in the state and that the state has tools as effective as EPA for enforcing the program. One issue of potential concern in this regard is discussed below.

The bill provides for states to implement the federal program pursuant to subsection (i). Subsection (i)(2) requires the Administrator to withdraw state authorization if "a State is not enforcing the requirements of this

section in a manner equivalent to Federal enforcement." This subsection is silent, however, on what happens when the state can no longer implement the program. The federal program should automatically apply, and clarifying language should be added.

XII. Citizen Participation

Citizens' ability to participate in implementation of this program and to enforce its terms must be co-extensive with their rights under Subtitle C of RCRA. For example, section 3006 (f) of RCRA, provides that state programs must provide for public availability of information about "hazardous waste sites" and such information must be available to the public in substantially the same manner and degree as if EPA were carrying out the program. S. 196 should include comparable (or cross-reference existing) provisions to assure public access to information about facilities and sites handling ash.

Nowhere in the bill is there any provision for judicial review of permits. This issue should be of interest to the regulated community as well as to citizens. Permits should be subject to judicial review as provided under section 7006(b) of RCRA.

EDF appreciates the opportunity to present our views to the Subcommittee today.

APPENDIX 1

ENVIRONMENTAL DEFENSE FUND

1616 P Street, NW
Washington, DC 20036
(202) 387-3500

March 3, 1989

EDF PROPOSAL FOR DESIGN OF MSH INCINERATOR ASH MONOFILLS

EDF proposes that ash monofills be designed with two liners and two leachate collection systems (see Figure 1), and after filling, be covered with a composite cap, overlain by a vegetative cover, as specified below:

The liner system should consist of an upper (primary) flexible membrane liner (FML) constructed of, or equivalent to, a 60-mil thickness of high density polyethylene (HDPE). The lower (secondary) liner should be a composite liner consisting of two components: an upper FML identical to the primary liner, immediately underlain by a minimum 3-foot thickness of clay or other natural soil compacted to a maximum hydraulic conductivity of 1×10^{-7} centimeters per second (cm/sec).

A primary leachate collection system should be required to be installed above the primary liner, capable of maintaining a hydraulic head not to exceed 12 inches. A secondary leachate collection system, which serves the additional function of a leak detection system for the primary liner, should be required to be installed between the primary and secondary liners.^{1/}

Upon closure, monofills should be required to install a final composite cover consisting of an upper FML immediately underlain by a minimum 2-foot thickness of clay or other natural soil compacted to a maximum hydraulic conductivity of 1×10^{-7} centimeters per second (cm/sec). The cover system should be overlain by a vegetative cover graded to control run-on and run-off.

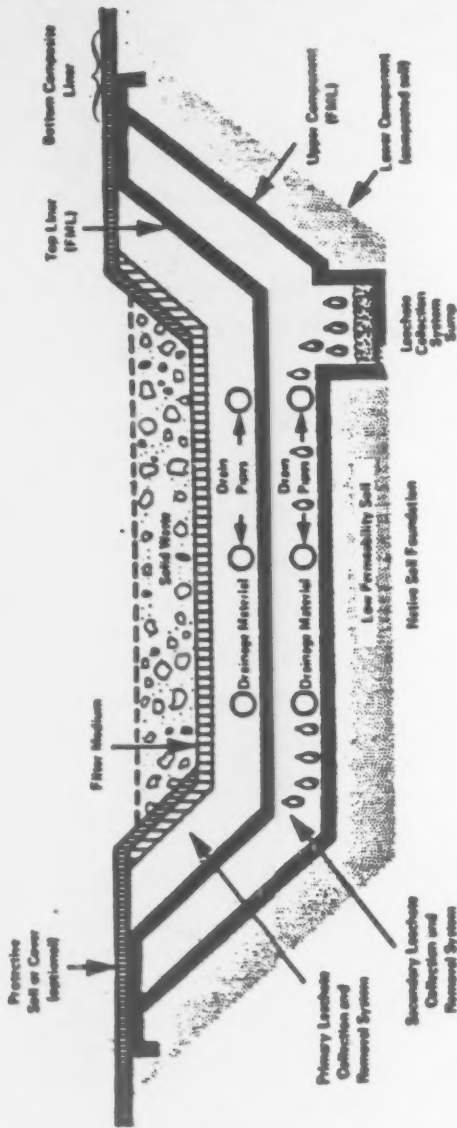
1. This system is essentially identical in design to the primary leachate collection system; its location between the liners allows it to function as a leak detection system for the primary liner.

FIGURE 1

202226

Federal Register / Vol. 52, No. 103 / Friday, May 29, 1987 / Proposed Rules

SCHEMATIC OF A DOUBLE LINER AND LEAK DETECTION SYSTEM FOR A LANDFILL



BEING PROPOSED AS THE LEAK DETECTION SYSTEM

SCALE: 1/4" = 1'-0"

The remainder of this paper will first describe the rationale for this design and will then present available cost information on our recommended design, demonstrating its cost-effectiveness.

Rationale: Each Element of the Recommended Baseline Design is Necessary for Proper Landfill Function

EDF considers the standard for ash monofill design described above to be necessary not only from the perspective of environmental protection, but also to enable any landfill containment system to function properly. Indeed, each of the components is an essential element of the containment system.

Our recommended standard is consistent with -- indeed, is necessary to achieve -- the goals of EPA's liquids management strategy, which was developed in the context of hazardous waste disposal but applies similarly to monofills (see, for example, 52 Fed. Reg. 20221, May 29, 1987). This strategy has two objectives: (1) to minimize leachate generation in waste management units, and (2) to maximize leachate removal at the earliest practicable time. Achievement of these two goals provides the framework for the following discussion of the rationale for inclusion of each of the design components recommended by EDF.

1. Need for a Double Liner with Double Leachate Collection

One of the advantages of a double-lined system over a single-lined one is obvious: liners are neither impermeable nor permanent, so some degree of what may appear to be "redundancy" is needed to provide effective containment. As EPA has clearly stated on several occasions:

"Although a liner is a barrier to prevent migration of liquids out of the unit, no liner can be expected to remain impervious forever. As a result of waste interaction, environmental effects, and the effects of construction processes and operating practices, liners eventually may degrade, tear, or crack and may allow liquids to migrate out of the unit.... It is evident to the agency that single-lined units allow

substantially greater migration of hazardous constituents than would double-lined units." (52 Fed. Reg. at 20220-21, May 29, 1987)

Efficient leachate collection and removal is a second advantage of a double-lined system. As EPA stated in 1987, "the double liner system is the mechanism by which leachate collection and removal can be maximized." Background Document on Bottom Liner Performance, page 2-20. In addition to providing two systems (rather than one) for collecting and removing leachate, buildup of any appreciable hydraulic head on the ultimate barrier -- the secondary liner -- is avoided by collecting the great majority of leachate off of the primary liner. Thus, even where leaks exist in the primary liner, in most cases the majority of leachate can still be removed and kept from ever reaching the secondary liner.

Early leak detection is a third critical advantage of double-lined systems. The leachate collection system between the liners serves several functions: it collects and removes any leachate that migrates through the primary liner, thus minimizing the hydraulic head on the secondary liner; it provides a means of detecting leaks in the primary liner at a time before such leaks have allowed contaminants to migrate out of the unit; and it provides a means of assessing the magnitude of such leaks, thereby increasing both the ability to respond to leakage and to assess the effectiveness of such responses. Obviously, a leak detection system offering these significant advantages is not possible without a double-liner system.

2. Need for a Secondary Composite Liner

The bottom liner in a double-lined system needs to provide several functions: (1) maximization of the detection capability of the leak detection

system; (2) maximization of leachate collection and removal from the secondary liner; and (3) minimization of migration of leachate and contaminants through the liner and into the environment. On all three counts, EPA and others have clearly documented the need for a composite bottom liner, rather than either a synthetic or natural liner alone. See 52 Fed. Reg. at 12566 (April 17, 1987); 52 Fed. Reg. at 20218 (May 29, 1987); and the accompanying Background Document on Bottom Liner Performance for documentation of these advantages, which are briefly summarized below.

The use of an upper FML component in the composite liner provides a highly impermeable layer off of which to collect leachate; the minimal migration of leachate through such a liner also increases the sensitivity of leak detection. In contrast, use of a more permeable natural soil or clay liner alone allows significant amounts of liquid to penetrate into the liner and eventually migrate out of the unit; such penetration also greatly reduces the ability to both detect and assess the extent of leakage.

The lower compacted clay or natural soil component of the composite liner optimizes liner function in several ways: it serves as a backup in the event of a breach in the FML component; its greater thickness reduces the likelihood of puncture or other damage during installation or landfill operations; it provides some attenuation of certain leachate contaminants that are capable of chemically binding to such soil materials; and, because it is in immediate contact with the overlying FML, it helps to "plug" any leaks in the FML that may exist or develop over time. EPA has indicated that a minimum thickness of 3 feet is necessary to assure the stability of the clay or other natural soil component of a composite liner (52 Fed. Reg. at 10710; March 28, 1986).

Finally, EPA has raised several concerns regarding sole reliance on clay liners for containing ash leachates. In particular, EPA has stated that the high alkalinity and salt content of such leachates are known to cause rapid deterioration of clay liners (Draft Guidance on Municipal Waste Combustion Ash, EPA Office of Solid Waste, Washington, D.C., dated March 14, 1988). They further state that some data indicate that chloride complexes of lead and cadmium in ashes move rapidly through clay soils ("Status of OSW's Municipal Waste Combustion Ash Efforts," Briefing for the EPA Science Advisory Board, April 26, 1988). These concerns offer additional rationale for the need for bottom composite -- rather than compacted clay -- liners in ash monofills.

3. Need for a Composite Final Cover

While the design elements discussed above are intended to contain and effectively remove liquids that enter or are generated in landfills, an equally important objective of EPA's liquids management strategy is to minimize leachate generation in waste management units. In addition to controls over liquids disposal (which the agency has proposed largely to prohibit), the major controllable element in reducing leachate generation is to reduce infiltration of liquid into the unit, which primarily enters in the form of precipitation. The final cover is critical in this regard in that it, along with appropriate run-on/run-off controls, provides the most effective means for reducing infiltration, particularly after closure of an active unit. As EPA stated in 1982 when it required composite final covers for hazardous waste landfills: "While liners may remain effective at preventing migration from the unit until well after closure, their principal role occurs during the active life. After closure, EPA believes that a protective cap becomes the

prime element of the liquids management strategy" (47 Fed. Reg. at 32285, July 26, 1982).

A principal factor in determining the nature of the final cover is the permeability of the unit's liner system, since a cover that is more permeable than the liner(s) can result in the buildup of liquid in the unit (the so-called "bathtub effect"). For this reason, EPA has generally required final cover materials to be no more permeable than the unit's liner system. This, in turn, dictates the use of FML covers for landfills that employ FML liners. The greater durability and thickness of clay materials, along with the previously discussed advantages of using a combination of FML and clay liner materials rather than either alone, provide technical justification for the proposed requirement of a composite final cover. See 47 Fed. Reg. at 32314 (July 26, 1982) for further discussion of the rationale for this cover requirement.

4. Need for Additional Operating Practices To Minimize Leachate

Given the predominant role of infiltration of precipitation in the formation of leachate, especially during the active life of a landfill, steps must be taken to minimize the period of time during which wastes are exposed to precipitation. It is increasingly recognized that a phased filling operation can greatly decrease leachate generation. Phased filling involves the sequential filling of landfill cells, which are relatively small areas that can be filled quickly and then sealed with final cover.

We strongly support the use of a phased filling operation. In our view, a maximum period of time during which an active cell may remain open must be specified. Based on state regulatory or permit requirements, we recommend a maximum active cell life of no more than 12-18 months.

Cost Data

Several sources of information on the cost of designing a landfill to meet the double liner standard we recommend are available. EPA itself commissioned an extensive study of the costs of compliance with its revised hazardous waste landfill rule that would require such a design. The EPA study^{2/} derived estimates that allow a direct comparison between the costs of the double-liner system we propose and a single composite liner system. That is, the study estimates the incremental cost of adding an additional FML and leak detection system (LDS) to a design consisting of a leachate collection system underlain by a composite (upper FML and lower clay) liner. Moreover, it estimates these costs as a function of landfill size. Average annual incremental costs per ton of waste (assuming a 20-year time frame) for the additional design components varies according to landfill size (expressed in tons per year, or tpy) as follows:

tpy	1 Composite Liner, 1 LCS (\$/ton)	1FML/1Composite Liner + 2 LDS (\$/ton)	Added Cost (\$/ton)	% Increase
550	647.82	676.18	28.36	4.4
1100	402.55	418.91	16.36	4.1
2200	277.73	287.45	9.73	3.5
6600	181.82	186.36	4.55	2.5
16500	81.91	84.73	2.82	3.4
38500	60.09	61.91	1.82	3.0
66000	51.64	53.09	1.45	2.8
110000	45.91	47.09	1.18	2.6
165000	41.45	42.36	0.91	2.2

2. See Pope-Reid Associates, Inc., "Engineering Costs Documentation for Baseline and Proposed Double Liner Rule, Leak Detection System Rule, and CQA Program Costs for Landfills, Surface Impoundments, Waste Piles, and Land Treatment," EPA Contract 68-01-7310, Office of Solid Waste, March 1987.

These cost estimates, which include labor and materials, indicate a modest increase (2.2% to 4.4%) in total landfill costs for the added liner and leak detection system. For landfills serving 100,000 or more people (about 66,000 or more tons per year (tpy) of waste), added costs would be on the order of \$1.50/per ton or less. Even for smaller landfills, while per-ton costs are higher, the percent increase in total landfill cost for the added protection is still small and relatively constant with size.

[It should be noted that the above cost data are expressed in terms of costs per ton of waste. Costs for disposal of incinerator ash could be substantially less due to the generally greater density of ash. This issue is more fully discussed below.]

Several other sources of cost data provide support for this relatively minor increase in cost to add an additional synthetic liner and LCS. New York State recently prepared cost estimates for its new regulations that require double composite liners for all new municipal solid waste landfills. While it did not examine economies of scale for landfills of various sizes, it did provide unit costs (i.e., cost per unit area for liners and leachate collection systems). These cost estimates are summarized in the table below. The New York cost data have been converted into cost-per-ton-of-ash estimates by assuming a 60-foot depth of ash at capacity, which represents 18 tons of ash per square yard of filled area (at 1800 pounds per cubic yard).

NEW YORK STATE UNIT COSTS

Component	Cost/yd ²	Cost/ton of ash
40-mil FML (for cover)	\$ 4.63	\$0.26
60-mil FML (for liner)	6.42	0.36
Clay liner, 3 feet thick (10 ⁻⁷ cm/sec)	15.33	0.85
Leachate collection system	1.22	0.07

Cost figures include materials, installation, and quality assurance/quality control.

Using these unit costs (as well as the costs for the requisite drainage layers, filter fabric, etc.), New York estimates that its double composite liner/double leachate collection system would cost \$49.05/yd², or \$4.09/ton of MSW. A final composite cover (with a gas venting layer) is estimated to cost \$24.70/yd², or \$2.06/ton of MSW. After accounting for the greater density of ash (typically 1800 pounds per cubic yard, versus 1200 for MSW), these costs would be \$2.73 per ton of ash for the liner system and \$1.37 per ton of ash for the final cover.

EDF's proposed liner and cover design standards differ somewhat from New York's more stringent requirement; using New York's unit costs, EDF's double liner proposal would be slightly less expensive: \$2.61 per ton of ash. Adding to this the cost of EDF's composite cover design (\$1.17 per ton) results in a total additional design cost of \$3.78 per ton of ash.

This value can be further translated into two other useful cost estimates. Because incinerators significantly reduce the weight of MSW, a ton of MSW generates considerably less ash. Assuming a typical weight reduction of 75%, the increase in the incinerator tipping fee (the amount charged per ton of MSW received) that would result from EDF's proposed design would be only 95 cents per ton (i.e., 25% of \$3.78). The added cost to an individual

citizen, who typically generates about two-thirds of a ton of MSW each year, would therefore be about 63 cents per year, a truly trivial expense for the added protection of EDF's design.

Several other studies provide comparable estimates of unit costs for the same or similar materials. (It is not clear whether these estimates include only materials, or also installation costs). These studies and their estimates (expressed in terms of dollars per ton of ash) are as follows:

MBS *	60-mil FML (\$/ton)	
	0.25	
GLEBS **	??-mil FML (\$/ton)	3 feet Clay (\$/ton)
	0.25-0.50	0.05-0.19

* Multinational Business Services (MBS), "Potential Subtitle D Compliance Costs for Municipal Landfills -- An Analysis," June 1987

** Glebs, R.T., "Landfill Costs Continue to Rise," Waste Age, March 1988, pp. 84-93.

Actual construction costs for an ash monofill provides further support for these estimates. A 6-acre monofill (with capacity for 202,500 yd³ of ash) equipped with a composite liner and a composite cover was recently constructed in Marion County, Oregon; county officials report that the total cost (for land acquisition, design and construction, and operating and maintenance) was \$16.50 per ton (Randall Franke, Marion County Commissioner, presentation at a seminar on MSW Incinerator Ash sponsored by the Northwest Center for Professional Education, held in Orlando, FL on December 1, 1988).

The Pope-Reid, New York, MBS, Glebs and Marion County data are all relatively consistent, and indicate modest incremental costs for meeting the design standard we recommend for ash monofills, subject to only slight economies of scale; total landfill costs should be increased by considerably less than 10%. When judged in the context of the tremendous increase in containment system performance and the concomitant environmental benefits, we simply see no justification for requiring anything less.

483

TESTIMONY
OF
ROGER ETTER
CHAIRMAN
WASTE COMBUSTION EQUIPMENT INSTITUTE
ON
S. 196
BEFORE
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
U.S. SENATE

SEPTEMBER 21, 1989

My name is Roger Etter. I am here today as Chairman of the Waste Combustion Equipment Institute (WCEI), a part of the National Solid Waste Management Association. Accompanying me is the Vice Chairman of the Institute, Steve Shuler. The WCEI is a trade association representing companies that develop waste combustion technologies for various specialty waste incineration applications including municipal systems (less than 250 tons/day), hospital, commercial, and hazardous industrial waste destruction. The WCEI supports the position presented by Allen Moore of the NSWMA but would like to expand on issues of particular concern to our membership.

The WCEI supports the development of a national solid waste management policy based on the integrated waste management approach and one that provides prompt stability in a waste crisis that is quickly getting out of control.

As a nation, we must reduce the quantity of waste generated, particularly the potentially harmful components in that waste stream. We need to recycle and reuse as much of our wastes as possible. However, technical as well as market limitations, currently restrict these waste management techniques. Environmentally sound incineration also plays a key role in this integrated waste management approach. Waste combustion equipment can be designed to complement reduction, recycling, and reuse of waste -- NOT discourage them. Furthermore, properly designed and operated landfills are needed for the final disposal of substantially less quantities of waste.

S. 196 primarily addresses the situation confronting large cities and areas of high population density. However, this situation does not exist throughout most of the United States, unlike Europe and Japan where the technology used for the model of this legislation has been previously applied. The proposed legislation, as currently drafted, would effectively preclude the use of a principal alternative for much of the nation -- modern modular incineration systems. It legislatively sets minimum technology standards using a global definition of "municipal incineration facilities" and a "large city" technology model -- waterwall massburn systems with dry scrubber baghouse air pollution control technology -- that would prohibit hospitals, commercial facilities, and the small communities of rural America from resolving their waste disposal problems in an environmentally safe and cost-effective manner.

Unless amendments are adopted state-of-the-art modular incinerators will be precluded in applications of invaluable service. In particular, the waste disposal options for Rural

America and hospitals would be unduly restricted. Many smaller municipalities, which generate below 250 tons per day, will not be able to construct waterwall massburn units. Furthermore, these smaller municipalities will NOT be able to realistically afford to transport their wastes (approaching \$.50/ton-mile) to large, urban mass burn systems. For example, Fosston, Minnesota has a 75 tons per day modular system that disposes wastes from five counties in rural areas. With the shutdown of this facility and loss of landfill capacity, trucking raw garbage over 200 miles to Minneapolis may be their only option.

Similarly, small rural hospitals will likely require analogous transport of infectious waste. Unless some alterations are made in the proposed legislation, smaller communities and hospitals will be faced with disproportionate waste disposal costs and be compelled to rely on waste management techniques that are less environmentally sound than incineration.

Attached to this document is an overview of the nature, benefits and role of modular technology. Briefly, however, the new generation of modular waste combustion systems are predominantly American technologies, emerging from years of development in the USA. These systems typically employ a two-stage design to maximize control of the combustion process.

Modern modular waste combustion technology offers the following advantages:

- * It maximizes pathogen kill effectiveness
- * It minimizes emissions of potentially toxic organics, such as dioxins
- * It minimizes formation of nitrogen oxides from nitrogen in wastes
- * It minimizes entrainment of particulates & quantity of fly ash

There are changes that need to be made to S. 196 to assure that this valuable control technology continues to be available.

Attached to this document are specific comments relating to needed changes. In general, however, the WCEI believes that, if the Congress passes legislation which includes specified minimum standards, the law should be neutral with regard to the different types and classes of technology. There should be standards developed for each type and size of incinerator which reflect the technological feasibility appropriate for such systems. Administrative flexibility needs to be provided for those systems which are not specifically identified. Moreover, this is a rapidly changing technological field. Legislation should not inhibit the development of new more environmentally desirable products. For example, technology is being developed to remove

heavy metals from fly ash utilizing wet scrubbing air pollution control processes.

Future standards need to be based on nationally applicable technologies if they are to be nationally applied. Great caution needs to be exercised if decisions are made based on any local permit. Adequate flexibility needs to be included for different sizes, types, classes, categories, feed types, and other factors that may be appropriate. Monitoring requirements need to be altered to recognize the cost of monitoring on small systems and to allow flexibility to use surrogate operating parameters or monitors.

The WCEI appreciates the opportunity to present testimony at this hearing. There is additional information that we will be submitting to the record regarding the implications of S. 196 as soon as it becomes available.

ATTACHMENT A

MODULAR INCINERATION TECHNOLOGY: AN OVERVIEW

The new generation of modular waste combustion systems are predominantly American technologies, emerging from years of development in the USA. These systems typically employ a two-stage design to maximize control of the combustion process. The two separate combustion chambers are designed to consistently maintain the temperature, residence time, and air mixing that are necessary to achieve complete combustion. Unlike the waterwall massburn technology, no heat is extracted from the combustion chambers until the combustion process is complete. In this manner, combustion control is maximized, but additional air is required to maintain integrity of materials. The high degree of combustion control makes this technology capable of high destruction efficiencies for use in the permanent disposal of infectious, hazardous, and other specialty waste applications.

Modern modular waste combustion technologies offer the following advantages:

- * Minimizes emissions of potentially toxic organics, such as dioxins
- * Minimizes formation of nitrogen oxides from nitrogen in wastes
- * Minimizes entrainment of particulates & quantity of fly ash
- * Maximizes pathogen kill effectiveness

The cumulative effects from small generators of hazardous and infectious wastes are minimized with state-of-the-art modular technology that has been effectively used for hazardous waste and infectious waste disposal facilities.

The characteristics of the particulate emissions from modern modular waste combustion systems is dramatically different from other incineration technologies. The primary chamber design minimizes the quantity and size of the particulates entrained in the flue gases. The secondary chamber, with even temperature distribution profiles with a minimum of 1800°F for at least one second, is designed to achieve high destruction of organic components (small particles or vapors). The particulate emissions from modern modular waste combustion systems contain substantially less organic components, including potentially toxic materials such as dioxin.

Small, state-of-the-art modular waste combustors can play a significant role in reducing local health risks through on-site disposal as part of an integrated waste management approach for hospitals and other specialty waste applications. As an example, member companies have worked with clients to develop waste disposal programs that minimize wastes and associated health risks at their sites. The first part of such programs is to reduce, recycle, and reuse wastes. Substantial efforts that

dramatically change the purchasing specifications are included to eliminate potentially harmful components.

In a similar manner, unique characteristics of various air pollution control technologies can provide environmental trade-offs. The dry scrubber/baghouse systems, prescribed in the legislation, have not been sufficiently demonstrated in applications with modular waste combustion systems. The performance of the conventional dry scrubber/baghouse will be inhibited due to the greater air requirements of modular systems that provide the high destruction efficiencies. Uncorrected particulate concentrations of $<.006$ gr/dscf will be necessary to meet the standards specified in the bill. Also, many modular applications -- particularly hospital and commercial operations -- are not in continuous service and would have substantial operational and maintenance problems due to daily start-up and shutdown. As a result, modern modular systems have relied on state-of-the-art wet scrubber technologies or modified dry scrubber systems, designed specifically for the modular waste combustion technology.

American wet scrubber technologies and modified dry scrubbers have been substantially improved within the last five years. For example, the modern wet scrubbers, unlike conventional venturi scrubbers, can consistently achieve higher performance levels with less energy consumption, including the control of fine particulates. Advanced wet scrubber technologies designed for modular waste combustion systems provide the following advantages:

- * Consistently higher acid gas removal efficiencies
- * Consistently higher heavy metal removal efficiencies
- * Lower maintenance requirements and costs

In combination with modern modular waste combustion systems, either state-of-the-art wet scrubbers or modified dry scrubbers are very effective and provide environmentally sound pollution control alternatives.

ATTACHMENT B

SPECIFIC COMMENTS

Generally, the bill bases its legislative requirements on waterwall massburn systems utilizing dry scrubber baghouses. These systems are only available for the largest systems. The bill should be technology neutral. If legislative standards are set in the bill, there should be standards developed for each type and size of incinerator.

Technology Specific Standards -- The bill currently sets minimum requirements that must be met by all "municipal incineration units." Modular systems can meet or exceed all but one of these requirements. With either wet or dry scrubbing, modular waste combustion systems for more than 50 tons per day of municipal wastes need an initial particulate standard of .030 grains/dscf to be a realistic option for smaller communities. However, because modular incineration technology minimizes the generation of dioxin and heavy metal emissions, this slight increase in the initial standard does not pose an enhanced environmental risk.

Process After Standards -- The process of developing new standards needs to be altered in ways to enhance technology development for municipal incineration and to assure that the technology is available for all municipalities. While the bill allows the Administrator to distinguish between types and classes of incinerator, it needs to provide for distinctions based on factors such as size (i.e. heat release rate), waste type, and technology. Additionally, some mechanism needs to be included in the bill to assure that any single facility that is permitted does represent a nationally applicable standard. For example, once a new facility is operable, it might be subject to a national public review to determine whether it constitutes a feasible, nationally applicable technology for a specific class or category of municipal incinerator.

Monitoring & Testing Requirements -- The bill currently requires continuous monitoring and testing for a specific list of operating characteristics. Activities that are underway could define effective surrogates for many of these items. The bill should not preclude the use of alternative, equally effective monitoring techniques. For smaller sources, the bill allows some flexibility but none the less requires a number of specific parameters to be continuous monitored. Further flexibility needs to be provided because continuous monitoring of all these parameters is not necessary to preserve environmental quality, but is cost prohibitive.

Small Incineration Systems -- Modular incinerators with rated system capacities of less than 18.8 MMBtu/Hr (i.e. approximately 50 tons per day of municipal waste) can play a major role in on-site, environmentally safe destruction of

infectious and other special wastes. Due to major differences in the types of systems and waste characteristics, the Administrator should be allowed to develop separate regulations according to technology, size classifications, and type of application. Organizations such as the Waste Combustion Equipment Institute can provide substantial assistance in the development of the performance standards, as well as needed operational and maintenance requirements, that include operator training and certification. If properly classified and regulated, these smaller systems can provide environmentally safe, but cost effective waste disposal options. In this manner, hospitals, for instance, can responsibly handle their wastes on-site or at a nearby regional incineration facility and avoid the environmental risks of hauling infectious wastes hundreds of miles. This provides a substantial reduction in waste disposal costs and liability to the waste generator.

TESTIMONY OF ALLEN MOORE, PRESIDENT
NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION

before the

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
of the

U.S. SENATE COMMITTEE ON
ENVIRONMENT AND NATURAL RESOURCES

September 21, 1989

TESTIMONY OF ALLEN MOORE, PRESIDENT
NATIONAL SOLID WASTES MANAGEMENT ASSOCIATION

before the

SUBCOMMITTEE ON ENVIRONMENTAL PROTECTION
of the
U. S. SENATE COMMITTEE ON ENVIRONMENT
AND NATURAL RESOURCES

September 21, 1989

Mr. Chairman, my name is Allen Moore, President of NSWMA. I appreciate the opportunity to testify today on S. 196, the Municipal Waste Combustion Control Act of 1989.

NSWMA is a trade association representing commercial waste service firms. Among our membership are many firms involved in different aspects of waste combustion. Members of the Institute of Resource Recovery (IRR) design, build, and operate facilities that recover energy from trash and reduce its volume for ultimate disposal. Members of our Institute of Solid Waste Disposal (ISWD) provide landfill capacity for disposal of combustion ash. The members of our Waste Combustion Equipment Institute (WCEI) manufacture small-scale modular waste combustion systems for municipal, hospital and other waste types.

We commend you and the sponsors of this legislation for your leadership on the Clean Air Act reauthorization and resolving critical issues related to the disposal of ash from municipal waste combustors. The lack of a clear Federal policy concerning the disposal of ash from waste combustion facilities has become a serious problem. The growing volume of solid waste and ash being generated, the legal ambiguities and regulatory uncertainty which exist, combined with a growing patchwork of often inconsistent regulations at the state level and the potential for adverse court rulings warrant your most prompt consideration. Congress must resolve these important policy issues because the EPA will not and the courts should not. A legislative resolution is essential here, and NSWMA strongly urges the enactment of ash disposal provisions.

With regard to the air emissions provisions of S. 196, we believe it is important to consider these proposals in the context of current air emission regulation and pending proposals to amend the Clean Air Act. EPA is in the final stages of promulgating regulatory controls on new and existing waste combustion facilities under the current legislative authority of the Clean Air Act, and the Act itself, as you know, is in the midst of a comprehensive review and revision.

We appreciate the opportunity to share with you our views on these issues. We commented on similar provisions in the Clean

Air Reauthorization legislation reported by this Committee during the last Congress, and some of our concerns have been addressed. We are hopeful that continuing this dialogue will produce a bill that NSWMA and its members would endorse. This hearing is a valuable opportunity to move this process ahead.

BACKGROUND

It is axiomatic that the first and foremost reason to manage solid waste is to protect public health. We manage our trash to avoid the spread of disease and to prevent contamination of land and water resources.

Combustion of municipal solid waste offers a distinct advantage as a management tool through the destruction of organic portions of the waste stream. Thermal treatment by combustion destroys bacteria and viruses growing in our food wastes, destroys harmful organic compounds found in solvents, pesticides and other common products, and produces a biologically inert ash residue. Combustion greatly reduces the volume of waste requiring land disposal while, in the case of waste-to-energy facilities, recovering valuable energy. In addition, in our experience waste combustion is completely compatible with aggressive recycling programs. Our members regularly assist in the implementation of community recycling programs in conjunction with building and operating a waste combustion facility. Some of these recycling programs, Marion

County, Oregon to give but one example, are among the best in the country.

Modern resource recovery plants are designed to use the best combustion practices and pollution control technologies presently available, including scrubbers, electrostatic precipitators and fabric filters. Indeed, because these plants account for a surprising percentage of the major new industrial facilities built in the United States in the past decade, this industry has been a testing ground for development and use of improved pollution control technologies. As a result, waste-to-energy plants are models of how emissions from the vast number of other stationary combustion sources can be controlled.

Comprehensive, integrated approaches to solid waste management, which rely in part on waste combustion, can be achieved in communities across the country, without compromising the goal of clean air.

INDUSTRY UPDATE

For over 15 years the NSWMA has been in the forefront of efforts to incorporate an integrated approach to solid waste management that includes waste minimization, recycling, resource recovery through waste combustion and land disposal. Members of NSWMA provide 100 percent of commercial services for

recycling and nearly 80 percent of the nation's capacity in land disposal. The facilities our members operate account for half of the capacity of major waste-to-energy projects built in this country since 1985. Almost two-thirds of the capacity of major waste-to-energy projects now under construction is being built and will be operated by our members.

The use of waste-to-energy is growing dramatically in the United States. In 1983, 50 facilities burned 7.6 million tons of trash. By 1986, the number of plants grew to 81, and the amount of trash processed expanded to almost 12 million tons. This year, 122 waste-to-energy facilities in 36 states will burn over 21 million tons of trash. The energy that will be recovered from that trash is equivalent to 33 million barrels of oil. Also, because combustion reduces the waste volume by up to 90 percent, available landfill capacity can be preserved for ash management and non-combustibles in those communities where waste-to-energy is a viable alternative.

THE NEED FOR A FEDERAL POLICY ON ASH DISPOSAL

Enactment of the ash management and disposal provisions is, we believe, critical to the future of waste combustion as a component of integrated solid waste management. In the absence of Federal ash management standards, existing, current and future investment in waste combustion facilities and the additional waste disposal capacity it promises will be at risk.

The lack of federal direction in this area is causing serious concern at existing facilities, which are subject to periodic changes in state and local regulations. Development of new facilities also is impeded because communities cannot anticipate future regulatory requirements.

This spring in Michigan, for example, a shift in the regulatory policy of the State Department of Natural Resources temporarily closed three of four previously-operating waste-to-energy facilities and prevented Detroit's newly completed facility from opening. Until the state passed emergency legislation, each day, over 4,800 tons of Michigan's trash per day was being disposed in landfills, limiting a critical resource capacity for that management option.

Not surprisingly, the lack of a Federal policy has resulted in a patchwork of conflicting state rules. New York State, for example, defines combustion ash as a special, non-hazardous waste and has developed specific design standards for ash disposal facilities. But in New Jersey, each facility must undergo elaborate and complex testing of its ash every week. If the ash does not meet certain criteria, it must be disposed as a hazardous waste. If it does pass this test, it is disposed in a Subtitle D (municipal solid waste) landfill.

The logistical and financial problems of maintaining two different systems for managing, transporting, and disposing of the ash are nearly overwhelming. Moreover, in this regard, it is important to remember that the increased costs which result from regulatory uncertainty fall directly on citizens in communities utilizing the facilities.

Congress must act because nothing less than a law will solve the problem. Earlier this year, EPA officials appeared before a House Subcommittee and urged passage of ash management legislation so that EPA could proceed with regulations based on a clear legal foundation.

We believe EPA is ready to act. Last year, EPA completed draft technical management guidelines for combustion ash. Though never officially issued, those guidelines have been widely distributed among state agencies. Today, local communities and states often use them to establish requirements for ash disposal landfills. But the draft lacks the force of law, which is necessary to provide regulatory certainty.

Moreover, because of uncertainty about intended Congressional policy on ash management, the guidelines would certainly be challenged in court on the question of whether ash should be regulated under RCRA Subtitle D or Subtitle C. Such a legal

challenge would take several years to resolve, with the possible result that existing landfills and ash disposal programs could be rendered illegal overnight.

In fact, that type of litigation is already proceeding through the courts. Two pending lawsuits, filed over a year ago, attempt to discern whether Congress intended municipal waste combustion ash to be subject to Subtitle C regulation. See EDF v. Wheelabrator Technologies, Inc., No. 88 CIV 0560 (S.D.N.Y.); EDF v. City of Chicago, No. 88-769 (N.D. Ill.). There is no indication of when these cases may be decided.

The U.S. Court system is not an appropriate forum in which to resolve this issue. The length of time that could elapse before a decision can be reached adds to uncertainties. Another more basic difficulty is that the courts are limited in their options when they do hand down a judgment. Should the courts find that Congress intended ash not to be subject to Subtitle C of RCRA -- which we believe is the correct interpretation -- they would still lack the authority and the technical expertise to lay out a comprehensive regulatory program for safe ash disposal.

If, on the other hand, the courts should rule that ash is subject to Subtitle C of RCRA, this country could instantly

face a crisis in the disposal of both combustion ash and hazardous wastes. A significant portion of the ash would have to be managed in distant, scarce hazardous waste disposal facilities. Transportation costs alone could become prohibitively expensive. We submit that this could be a senseless waste of a true national resource, which is our existing, state-of-the art, hazardous waste disposal capacity.

ASH MANAGEMENT AND DISPOSAL PROVISIONS OF S. 196

Enactment of ash management legislation by this Congress -- complemented by an aggressive RCRA Reauthorization as contemplated by the Chairman's bill, S. 1113, and Senator Chafee's bill, S. 1112 -- would do much to eliminate the climate of uncertainty that impedes the development of effective solid waste solutions for our country. We draw this relationship purposefully. NSWMA believes that a number of provisions that the Congress is contemplating in S. 196 deserve a more comprehensive and deliberate scrutiny in RCRA Reauthorization.

We are concerned, for instance, that the Clean Air Act may be too limited an arena for Congress to develop the specifics of the comprehensive recycling program that this country so desperately needs. For example, while promoting recycling in communities served by waste-to-energy plants, S. 196 is silent on the mechanisms upon which the success of recycling depends

so critically -- market development. On this point, I believe, there is almost universal consensus.

Similar concerns exist for the bill's requirement to initiate State solid waste planning, but only in those communities evaluating waste combustion facilities, and before Congress has established a process for identifying the capacity needs of our States and communities. Such planning provisions should not be included in separate municipal combustion legislation, but rather be given careful attention and deliberation in the RCRA Reauthorization process.

Notwithstanding that recommendation, NSWMA believes that S. 196 provides an excellent framework for Congress to resolve the immediate problem of the technical and legal questions regarding ash management. NSWMA has a number of suggestions to support the Committee in that purpose.

First, S. 196 rightfully establishes a principle of "minimum technical requirements". EPA, the States, the regulated community, and the public at large will have a clear signal of the performance that Congress expects of our ash management process. NSWMA's concern is not with that principle, but, instead, with how far it is to be specified in statute, and what should be left to the more technically deliberate process afforded by EPA Rulemaking.

Our recommendation is that the legislation limit itself to specifying the general category of alternatives that are available, and the types of technologies that are expected to be applied, without establishing the detailed specifications for each technology. In this regard, I would note that EPA has in testimony before the House raised the concern that the double-composite liner requirement now in the bill for cofills of ash and other municipal solid wastes is not technically justified and is inconsistent with the overall RCRA regulatory scheme for landfill design. The legislation would require more rigorous design requirements for ash cofills than Congress and EPA have previously felt necessary for our most toxic industrial wastes. We share EPA's concern.

There is precedent for an approach based on specifying general categories of alternatives in the Minimum Technological Requirements (RCRA §3004(o)) established by Congress in the 1984 RCRA amendments. In fact, the Chairman's RCRA Reauthorization Bill, S. 1113, references that very approach in its provisions on ash management.

Our second recommendation concerns the mandatory ash treatment requirements included in S. 196's provisions on ash reuse and the "test-out" option for ash disposal.

Let me preface our recommendation by making clear our support for the policy underlying both of these proposals. Just as it is important to find ways to reduce the amount of solid waste generated and to recycle as much of our trash as we can, it is vital to utilize current technology to reuse the combustion ash.

Technological means exist and are being developed for the safe reuse of ash. In Europe, for example, combustion ash is often used as road-bed material in place of gravel and stone. In this country, studies are underway to determine whether ash can be safely used as aggregate in concrete blocks for use in artificial ocean reefs to prevent erosion and protect coastlines. Research and development on this and other uses of ash needs to continue, and legislation must establish a regulatory scheme under which it and the actual reuse of ash can proceed.

NSWMA also is supportive of maintaining a "test out" option for ash disposal. Such a provision allows for the co-disposal of ash with other trash in a landfill that has a liner, leachate collection, groundwater monitoring and otherwise complies with the Subtitle D requirements for new facilities. Today, in some states, ash which passes the EP Tox test can be mixed with trash and disposed in facilities without proper environmental safeguards. S. 196 would assure that following the transition

period even ash which passes the required test is disposed of in a facility with these controls. We support this change.

NSWMA is concerned, however, that in establishing the "test-out" option for the disposal of ash and in providing a regulatory scheme for the reuse of incinerator ash, S. 196 unnecessarily mandates that certain ash be treated prior to its disposal or reuse. In the case of the "test-out" option, we do not believe that ash which meets established criteria should be treated prior to disposal.

Similarly, we are concerned that mandating treatment prior to the reuse or recycling of ash may unnecessarily retard continuing research and development in this area. Why erect a statutory barrier prohibiting EPA from exercising its judgment to determine when reuse of ash without treatment does not present an environmental hazard? Current research shows that there may be environmentally-sound ways to reuse ash from existing facilities. Moreover, as waste minimization, recycling, and other techniques are increasingly used to remove toxic materials from the waste stream, it remains quite possible that the levels of toxic constituents in ash produced by burning the remaining waste will be significantly decreased.

AIR EMISSIONS PROVISIONS OF S. 196

I would like to turn now to the air emission provisions of S. 196 and discuss our views regarding its provisions. Before

doing so, however, I would like to briefly bring the Subcommittee up to date on how waste combustion facilities are, and will be, regulated with regard to air emissions. It provides a useful perspective from which to review the legislation.

As I mentioned earlier, EPA is mandated by court order to, by November 30 of this year, issue a Notice of Proposed Rulemaking for New Source Performance Standards ("NSPS") for new municipal waste combustion facilities and emissions guidelines for existing municipal waste combustion facilities. A Final Rule will be issued in December 1990. However, because Section 111 provides that NSPS standards apply to facilities which commence construction after the date the regulations are proposed, this NSPS will be in effect for new facilities within a matter of weeks. The authority of Section 111(d) will be used to apply the emission guidelines to existing facilities.

Although the regulations are to be issued pursuant to Section 111 of the Clean Air Act, the suit which gave rise to the court order also was based on Section 112, which regulates toxic emissions. We therefore expect regulatory concerns with regard to toxic emissions to be reflected in the proposed regulations.

In the meantime, states are issuing permits for new waste combustion facilities, under existing law, following EPA

guidance on Best Available Control Technology ("BACT") and their own stringent emissions requirements. This guidance calls for acid gas scrubbers, stringent exhaust gas filtration, controlled combustion practices and other strict control technologies. The combination of these requirements is, to our knowledge, already more stringent than air emission limitations on any other combustion device in the country, including fossil fuel power plants. The NSPS will adjust these requirements as appropriate.

Turning to the specific air emissions provisions of the bill, I would like to focus first on the requirement that EPA issue new emission standards for new waste combustion facilities within 18 months of the date of enactment. Given that EPA's NSPS rulemaking is almost complete and will be in effect by the end of the year, we question the need to direct the EPA to issue yet another NSPS within eighteen months of enactment. Already, communities which are developing waste combustion plants have adjusted their planning schedules in order to meet the standards that EPA will issue in November. An additional rulemaking addressing exactly the same issues, though with a different BACT standard and newly legislated maximum emission levels, will add additional complexity to the process. With it will come additional costs and further delay, thereby exacerbating our current municipal solid waste disposal crisis.

We also do not believe that the Congress, if it elects to mandate a new NSPS, should dictate specific numerical standards in the statute. To illustrate this concern, let me focus on one aspect of the proposed requirements for new resource recovery facilities. In our view, the requirement contained in S. 196 that EPA not set an emission standard for carbon monoxide ("CO") in excess of 50 ppm averaged over a 4-hour period would not allow for the proper management and operation of a large waste-to-energy facility equipped with currently available emissions control technology. There is, as you would suspect, variability in the "fuel" that feeds the combustion chamber -- all garbage is not alike. Our combustion controls can adjust for this, but not without variation in the specific emissions that may result at any given time. In practice, it takes awhile to determine from available performance data whether adjustments are needed in the operation of the pollution control equipment. And then, from the time we initiate an adjustment, it commonly takes about an hour before the effect on emissions is evident. The 4-hour averaging period is too short and the 50 ppm limit is too low to allow for the proper and efficient operation of these facilities.

Modern, large waste-to-energy plants operating 24 hours a day, 7 days a week still have periods of start-up, shut-down, process upset and times when they burn auxiliary fossil fuels.

These conditions, while rare, must be considered in order to avoid mandating emissions limitations and averaging times which are beyond what the technology can achieve. While it is not unreasonable to "push the technology", the technology contemplated in S. 196 is only three years old and has been employed on a limited number of plants. To our knowledge, these plants do not meet the CO emission level set by the bill. It is premature to require limits which are beyond today's capability.

We believe that a standard of 100 ppm averaged over a 24 hour period is a superior technical standard for large mass-burn waste-to-energy facilities. It would permit these facilities to operate more efficiently, and is still fully protective of public health and the environment.

Another example of our concern about setting technical standards in legislation involves the uniform application of these pollution-control technology requirements and standards to all waste streams and types of combustion technologies. Members of our WCEI believe that differentiated standards are needed to give proper consideration for not only the technology, but also the size of the emission source. In some applications, costly air pollution control technology may not be necessary to maintain equivalent levels of environmental

quality. We are in the process of collecting data supporting this position, and will make these available to this Subcommittee as soon as possible.

We have other technical concerns regarding the specific numerical standards and technical requirements in the bill -- these are, in fact, issues which EPA is addressing in its current rulemaking. While we believe this is the proper forum in which to resolve such technical issues, I would be pleased to respond to questions from the Subcommittee on these issues and continue to share additional information or technical expertise which may be of assistance to the Subcommittee.

Related to our concern over the specific standards included in the bill is a provision in S. 196 which establishes a definition of "best available control technology" ("BACT") which would apply only to the rulemaking on new waste combustion facilities. In doing so, it would cause needless confusion at EPA and in the courts. We understand that Congress may consider a modification to the generic definition of BACT in it's Clean Air Act deliberations. We suggest that S. 196 be brought into conformance with the result of these deliberations by a single reference to the generic definition rather than by a separate definition which could be inconsistent.

The NSWMA also is opposed to provisions mandating the retrofit of existing municipal combustor facilities when the retrofit of these facilities is not necessary either to meet ambient air quality standards or to control emissions of hazardous air pollutants to a level necessary to protect human health and the environment. This morning, the Subcommittee heard testimony on legislative proposals to revise Section 112 of the Clean Air Act. The legislation would impose technology standards and mandate the retrofit of "major sources" of toxic air pollutants. It also would provide a program for the control of the emissions from "non-major sources" which affect human health and the environment. To the extent that such a program under Section 112 would require the retrofit of new pollution control equipment to both new and existing waste combustion facilities, the NSWMA and its members see no reason why our facilities ought to be exempted from these requirements. On the other hand, to the extent that such facilities are not major sources of toxic emissions -- and, our preliminary assessment suggests that they are not -- and do not emit toxic pollutants that harm human health and the environment, it is difficult to discern the policy objective achieved by the mandated emissions retrofit program contained in S. 196.

Our suggestion that Section 112 be used to regulate toxic emissions from waste combustion facilities is not intended to

delay our having to meet any necessary requirements. If S. 816, the "Toxics Release Prevention Act of 1989", and S. 196 are enacted simultaneously as part of the same bill, the requirement to retrofit waste combustion facilities -- if they are a "major source" of toxic emissions -- could well become effective prior to the retrofit requirements of S. 196 coming into effect. The comparison is not simple because the provisions are drafted differently, but the point remains: if waste combustion facilities are "major sources" of toxic emissions, then they would be regulated pursuant to Section 112 of the Clean Air Act as it is likely to be amended in as timely a fashion as they would pursuant to the retrofit requirements on existing facilities contained in S. 196.

Finally, NSWMA and its members are concerned about provisions in S. 196 which would require periodic retrofits on all facilities, including those new facilities which come on-line after the bill is enacted. New Section 129(f) would require that at intervals not to exceed 5 years, facilities would be required to add new pollution control equipment or comply with additional permit conditions if the cost of these improvements would not exceed "minimal cost". "Minimal costs" is defined as not exceeding 5 percent of the actual capital cost of the unit. The provision also requires that after 20 years of operation every facility be retrofit to meet the New Source

Performance Standard in effect for municipal waste combustors. Such continuing retrofits and improvements are required, we would note, independent of whether they are needed to meet ambient air quality standards, to reduce levels of toxic or other air emissions to health or environmentally-related levels, or for any other discernable purpose.

Turning first to the requirement that retrofits costing less than 5 percent be mandated on a five year cycle, the Subcommittee should know that large waste-to-energy facilities typically cost in excess of \$100 million to build. Thus, "minimal cost" can entail expenditures up to \$5 million per facility -- and this could be required every five years. As regards the twenty-year update to New Source Performance Standards, this may coincide with the current term of financing used to construct many of these facilities, but it may be completely out of cycle with the useful life of such a facility. Retrofitting an existing facility to meet the standards established for new facilities can potentially entail millions and millions of dollars -- costs which would be directly passed on to the citizens of the communities served by the facility.

To date, the Clean Air Act has embodied a policy of not requiring existing facilities to retrofit and add additional

pollution control equipment unless this additional equipment control is needed to meet public health or environmental needs. We support this policy, and encourage the Committee to review these provisions and assess the public policy objectives which may be or may not be achieved in light of this policy.

CONCLUSION

NSWMA appreciates this opportunity to share with the Subcommittee it's major concerns and suggestions for improving S. 196. We appreciate the leadership which the Committee and Subcommittee Chairmen have demonstrated in proposing and considering legislation to address important issues on ash disposal and air emissions from waste combustors. The ash disposal provisions as suggested in S. 196 provide important and necessary guidelines for Congressional action, and we encourage the Committee and the Congress to move forward to craft appropriate legislation.

The NSWMA and its members would be pleased to work together with the Subcommittee and its staff to resolve issues of difference and assist in developing legislation that will effectively and efficiently protect human health and the environment.



The American Society of
Mechanical Engineers

Suite 218
1825 K Street, N.W.
Washington, DC 20006-1202
202-785-3756

Statement of the
Solid Waste Processing Division
of the
American Society of Mechanical Engineers
on
S. 196

Before the
Subcommittee on Environmental Protection
Committee on Environment and Public Works
U.S. Senate
September 21, 1989

Mr. Chairman and Members of the Subcommittee:

My name is John Norton. I am a Registered Professional Engineer and the Director of the Solid Waste Management Department for Montgomery County (Dayton) Ohio. I appear before you today representing the Solid Waste Processing Division of the American Society of Mechanical Engineers (ASME).

We are pleased to have this opportunity to present our views on S. 196, the Municipal Waste Combustion Control Act of 1989. The ASME Solid Waste Processing Division has member engineers working in industry, government, academia, engineering consulting, and plant operations. This statement represents the views of experts from the Division, a diverse group of engineers involved in solid waste management, rather than an official position of ASME.

Your attempt to address both ash and air concerns in one bill is laudable in that both issues must ultimately be resolved to the public's satisfaction in order to clear the way for implementation of these much needed facilities. However, we have concerns in both areas as they are addressed in the proposed legislation.

Solid waste disposal is now a crisis in the population centers of this country. Landfills are filling up and closing and most are not being replaced with new sites due to a combination of legislative and environmental concerns and local opposition.

Because the generation of trash continues daily, East Coast communities are shipping millions of tons per year as far as Ohio — over 800 miles round trip in many cases. Ohio's landfills are now filling rapidly. We may have as little as six years at these landfills left for our own Ohio wastes.

In Ohio, solid waste disposal is definitely a crisis. Our State Legislature just last year passed a new law demanding a 10 year plan for disposal for each county in Ohio. Most cannot comply — they can't identify 10 years worth of space for their trash. I can assure you that as Director of our county system, we are having to look West for our solutions as well — perhaps as far as Kansas, Nebraska, and the Dakotas!

Unfortunately, long distance transportation of waste to landfills in the interior of the United States may place the general public at far greater risk than municipal waste combustion facilities. In our opinion, right now, the health and welfare of the East Coast population is more at risk from increased trucking than it would be from the necessary new combustors.

The exhaust alone from the trash transfer trucks in use at the present time poses a greater hazard to the environment than the emissions from the necessary incinerators. The World Health Organization has determined that 90% of the world's ambient dioxin, for example, comes from cars and trucks. Very little of the other 10% comes from incinerators. Trucking is far worse than incineration with regard to air pollution.

In addition to exhaust concerns there is a likelihood of serious injury or death from traffic accidents resulting from huge increases in truck traffic. Accident statistics from any insurance company can easily be compared to the "worst case" health effects of a neighboring incineration plant.

Combustion technologies for municipal solid waste have been demonstrated over a long period of time in this country to be relatively environmentally benign when compared to the other options for disposal and management of solid waste.

We strongly believe that a variety of options must be available to manage and dispose of the nation's solid waste. In this regard, incineration of municipal wastes is making an important contribution to waste disposal and we believe it must remain a viable option along with landfilling, composting, and recycling.

We specifically appreciate the bill's repeated reference to the promulgation of regulations designed to preserve and protect the public's "health and environment." We heartily concur that this should be the main objective of regulations for municipal waste combustors. Unfortunately, that focus has occasionally been lost in the haste of promulgating regulations to protect the public from all too unlikely "worst case scenarios."

The bill's requirements for reduction and recycling of materials offer an opportunity to reduce the demand for landfills and incinerators. We recommend that waste reduction and recycling be given a reasonable priority in all aspects of waste management legislation and regulation.

However, we need market development for separated materials coupled with legislation and regulation on materials recycling. Separation of materials without use is not recycling.

We agree with the bill's objective to minimize the potential for hazardous waste disposal at these facilities by requiring EPA to issue guidelines for removal of certain items from the waste stream prior to incineration, and we support further investigation in this area. However, current information suggests that many constituents of concern such as heavy metals are pervasive in the waste stream. Therefore, we would proceed with caution before committing large expenditures of resources with the anticipation that a few components could be identified which, if removed from the wastestream, would significantly change its characteristics. More research is needed in this area. Any new regulations must be based on public health needs.

Combustion technology for municipal waste has been employed for decades in the United States with no discernable negative health effects. My own county has operated two large incineration plants for nearly 20 years, and before that the City of Dayton operated as an older type plant for at least 25 years. There is no evidence in my community of adverse health impacts from operation of these plants.

Both the County and the City are glad that their incinerator plants could help with the disposal of their daily waste, a recognized potential public health problem. Our own community health and environment are better off today for having had their service.

We have avoided the formation, use, and closing of at least three 80 acre landfills by having used these incineration plants.

Screened ash from these plants has been used for road and bike path construction over the years as well as for other minor construction works. The remainder has been stored in our 50 acre ash monofill which still has about 15 more years of space available — even if we are unsuccessful in rendering the ash useful under today's unreasonably strict regulations.

The residue from municipal solid waste combustion, "ash," is relatively sterile and only approximately 30% by weight and 10% by volume of the incoming waste stream. Public concern and regulation now restrain the disposal and reuse of this relatively benign substance. There is no scientific support for the present strict restrictions on ash utilization. In the U.S. EPA's new

"Draft Guidance [for] Municipal Waste Combustor Ash," the agency notes on page 7 that there are no "adverse effects on human health and the environment from exposure to [incinerator] ash or its leachate." But, their report goes on to say, there is a perception of threat, and instead of countering the irrational misperceptions, they go on to describe guidelines for regulating the perceived threat. Why not correct the misperception? Why solve the non-existent problem by spelling out guidelines that require expensive and apparently unnecessary physical modifications for ash fill sites -- several million dollars per community for physical barriers and several more million for new daily operations? The EPA must be directed to regulate for preservation of the public health and the environment, as your bill prescribes, but also to tell the public when that has been accomplished.

What is needed are reasonable requirements promulgated as quickly as possible with sufficient time to comply, and some assurance that after compliance there will not be unreasonable ongoing retrofitting requirements.

We support the underlying assumption of the bill that municipal waste incinerator ash can be effectively managed as a subtitle D waste with certain safeguards under the Resource Conservation and Recovery Act. EPA field data, as noted above, from existing landfills indicate that present ash disposal requirements offer sufficient protection for human health and the environment. This also is true of modern incineration of medical and infectious wastes.

New ash provisions need to provide the necessary flexibility for the U.S. Environmental Protection Agency and other regulators to consider local conditions and requirements. Arizona geology and weather conditions, for example, dictate certain engineering considerations which vary significantly from those necessary in Florida, Michigan, or the Dakotas.

Some attention should be focused on development of a more appropriate method of ash testing than is now available. The composition and characteristics of MSW incinerator ash are quite variable depending on waste stream composition, incinerator design and incinerator operation. In order to test the differing ashes properly there is a need for a test for untreated ash and on treated or stabilized ash which would approximate the actual conditions of ash disposal.

We believe recycling and reuse of MSW incinerator ash offers great promise to reduce the need for landfill space. Considerable resources should be directed towards developing processes and techniques that will help increase the recycling and reuse of this ash. We suggest that the bill include the authorization of a significant EPA research program on ash recycling and reuse. Once again preservation of health and the environment should be the guideline for ash recycling regulations.

We support the bill's requirements for setting criteria on training of personnel operating municipal solid waste incinerators. ASME has long seen a need to promote a model training and certification program for waste-to-energy facility operators, and as a result established the ASME Qualifications of Resource Recovery Facilities Operations (QRO) Committee. The purpose of

the GRO Committee is to propose a standard for plant operators. The ASME GRO Committee is preparing the Proposed ASME Standard for Qualifications and Certification of Resource Recovery Facility Operators and the final draft is expected to be ready for peer review by late 1989.

The bill's present requirements for air pollution control on municipal waste combustors cause us quite a bit of concern. They seem to require far more than health and environmental protection would dictate. A preliminary review of the requirements indicate that some of the limits may be impossible to meet on a continuing basis. We are particularly concerned about the CO requirement. How, for example, can a plant be designed to meet the requirements of any local permit or state regulation in the nation? Any such BACT requirement could stop all of the nation's programs at a whim.

Further, the requirement for permit review every five years would make the facilities impossible to finance over a period longer than five years.

Again we concur with your emphasis on preservation of public health and the environment, but caution that exceeding the reasonable requirements for such preservation is to dissipate the nation's limited funds which have equally important health based requirements in other areas -- such as infrastructure and housing.

Let me emphasize in closing that the public needs confidence in these incinerators, not more reason to doubt that properly engineered facilities are impossible. Reasonable, health based air pollution requirements are an

essential part of the solution. With more time, we can provide more specific input in this area of the bill.

Mr. Chairman, this completes my statement. Again, I appreciate the opportunity to offer our views on this important topic and will be happy to respond to any questions that you might have.



Natural Resources
Defense Council

40 West 20th Street
New York, New York 10011
212 727-2700
FAX 212 727-1773

TESTIMONY OF
ALLEN HERSHKOWITZ, Ph.D.
SENIOR SCIENTIST
THE NATURAL RESOURCES DEFENSE COUNCIL
BEFORE
THE SENATE COMMITTEE ON THE ENVIRONMENT AND PUBLIC WORKS
September 21, 1989

100% Recycled Paper

Washington Office:
1350 New York Ave. N.W.
Washington, DC 20005
202 783-7800

Western Office:
90 New Montgomery
San Francisco, CA 94105
415 777-0220

Natural Resources
Defense Council
212 Merchant St.
Suite 203
Honolulu, HI 96813
808 533-1075

The Natural Resources Defense Council (NRDC) is a national non-profit organization with over 100,000 members and a professional staff of attorneys and scientists dedicated to protecting public health and the environment. NRDC has worked closely with citizen groups, the private sector, members of Congress, Governors, state governments and regulators, the United Nations, the World Bank and, indeed, governments around the world in support of better controls on the management of municipal solid wastes. The views expressed here reflect more than six years of domestic and internationally oriented research and analyses, including almost one half dozen research trips to Europe and Japan, relevant to the variety of issues raised by our nation's current solid waste problem.

Because of the short time available to NRDC review and comment on this legislative initiative, our comments will be limited to only five substantial issues related to air emissions and we refer the committee to the comments of our colleagues from the Environmental Defense Fund regarding ash management.

1. The Need for State Plans.

NRDC recommends the use of federally required State Plans to coordinate effective solid waste management. We recommend that each State Plan include planning procedures pertinent to waste composition, procurement, market development and life-cycle costing analyses. The following mandated source separation program should be circumscribed:

- i) State plans should require that a waste composition analysis be performed by a) each municipality and b) any jurisdiction, government or authority considering the use of a waste to energy plant;
- ii) Based on the waste composition analysis required in 'i' above, state plans must require any jurisdiction, government or authority considering the use of a waste to energy plant to include provisions for removing the following material from waste streams to be incinerated:
 - a) non-combustibles, including:
 - glass
 - ferrous & non-ferrous metals
 - construction debris
 - b) incinerator-toxic materials, including:
 - household and automotive batteries
 - plastics containing toxic metals
- iii) State plans must require that any jurisdiction, government or authority considering the use of a waste to energy plant evaluate the combustible fraction of the

waste stream to identify and divert from any incinerator recyclables and compostibles contained therein, including but not limited to:

- *newspaper \ paper and paper products
- *office paper /
- *yard and food wastes
- *HDPE, PET plastics

This proposal conforms with Sec. 129 D, which states that "Standards under this subsection shall be based on methods and technologies for removal or destruction of pollutants before, during and after combustion..."

2. Tighten particulate emissions requirements.

Regarding Sec. 129(2)(B)(ii), NRDC believes the particulate emission standard should be no higher than 0.010 gr/dscf. Actual data from more than two dozen commercial operating facilities have confirmed that particulate emission rates considerably lower than that proposed in your bill are in fact routinely achievable.¹ Moreover, permits issued in Maine, California, Illinois, and Virginia limit particulate emissions to 0.01 gr/dscf, indicating that vendors can guarantee this achievable level of performance.²

3. The proposed retrofit requirements are not acceptable.

The retrofit provisions defined in Sec. 129 (5)(d) are unacceptable: On the one hand facility owners are offered seven and one half years to comply with the new requirements and on the other hand, the new requirements themselves are substantially more lenient than those for new facilities. What is the logic here? Even if you were to mandate that existing facilities be offered more time to comply with the tightest requirements applicable to new facilities, seven and one half years is twice as long as necessary. But you go much further and allow not only an excessively long retrofit time frame, but much less rigorous emission requirements as well. Neither the lenient time frame nor the emissions variations can be justified in terms of health effects benefits. In light of the fact that perhaps as much as half of all necessary incineration capacity is already on line or awarded³, more than 154,000 t/d tons of total capacity at more than 194 facilities⁴, the extraordinary variance is most unacceptable.

4. A dioxin emission limit is necessary.

Numerical dioxin emission limits are necessary. No other measure can assure the public that actual dioxin emissions will, in fact, meet the levels being promised by incinerator advocates. The Swedish Environmental Protection Board has established guidelines⁵ for dioxin emission limits from garbage burning incinerators.

These guidelines, based on actual sampling of emissions, set forth a target value of 0.5 to 2 nanogram per normal cubic meter dry gas at 10% CO₂ for dioxin emissions from existing plants (given as 2,3,7,8 TCDD equivalents according to the Eadon model) and 0.1 nanogram per normal cubic meter for new incinerators.⁶

Evidence from existing incinerators suggests that the Swedish limitations can be met by well operated, state-of-the-art garbage burning incinerators. Recent testing at the incinerators in Malmo, Stockholm and Linköping, Sweden, for example, show dioxin emissions of less than 0.1 ng/Nm³.⁷ Even lower levels were achieved at a pilot plant in Quebec City, Canada.⁸ And at the Marion County, Oregon incinerator, a level of 0.155 (Eadon) was recorded.⁹

Regulations should establish incinerator emissions standards for total dioxins and furans equivalent to the Swedish guideline of 0.1 nanogram per normal cubic meter at 10% CO₂ (Eadon equivalents) for new facilities and 0.5 to 2 for existing facilities.

5. Mandate the training and certification of incinerator personnel. Even the most sophisticated facility, with state-of-the-art pollution control devices, can emit high levels of air pollutants if poorly operated and maintained. Consequently, among the most crucial factors for controlling incinerator air pollution emissions is comprehensive training of operating personnel. As the New York State Legislative Commission on Solid Waste Management observed after touring garbage burning facilities in Norway, Sweden, Denmark and West Germany in 1985:

"Perhaps the most impressive feature of the facilities visited by our party was the strong commitment by on-site managers and personnel at every level to a high quality of operation and performance."

Environmental regulators are beginning to adopt strict programs for the certification of incinerator operators. In West Germany, operators of garbage burning facilities now undergo six months of theoretical training and two years on-site training prior to certification.¹⁰ And Michigan's Department of Natural Resources has called for implementation of a licensing program that would require incinerator operators to have knowledge of safety and special operating procedures "before they can assume their formal position at the facility."¹¹

The proposed incineration regulations do not fully address these issues. They do not provide even the broadest outline of the proposed certification program. And they do not clarify whether the rules would apply to a single or small group of top incinerator managers or to all key personnel on duty whenever the facility is in operation. Additionally, the proposed operator

certification rules are deficient in that (1) they apply only to operators of incinerators which have completed permit applications after June 1986, not to operators of existing or already permitted facilities, and (2) they do not require periodic operator refresher courses and re-testing after initial certification.

The incinerator rules should require that:

- 1) all personnel with control room responsibilities, not just top managers, must undergo comprehensive theoretical training and be certified by the state in such areas as combustion theory, air pollution control, ash handling, and safety and emergency procedures and must undergo re-certification every three years;
- 2) other incinerator employees who perform critical tasks (e.g., floor and crane operators) must also undergo appropriate training and certification programs;
- 3) all on-site personnel must be trained in occupational health and safety procedures; and
- 4) the training and certification requirements must be satisfied at all existing incinerators as well as at newly constructed facilities.

1. Actual data from more than 20 existing incinerators have confirmed that particular emission rates considerably lower than that proposed by DEC are in fact achievable. The Framingham, Massachusetts facility, for example, has recorded particulate levels of 0.007 gr/dscf. The Commerce (California) Energy Authority has monitored particulate emissions at its incinerator of 0.0043 gr/dscf. Monitoring at the Wurzburg, Germany incinerator revealed consistent particulate emissions levels of approximately 0.004 gr/dscf. Particulate monitoring at the North Andover, Massachusetts incinerator recorded levels of 0.005 gr/dscf. And recent data from the Rutland, Vermont plant revealed particulate readings of 0.003 gr/dscf. Twelve of thirteen incinerators with fabric filter controls, whose data were examined in one recent analysis, met a 0.010 gr/dscf standard.
2. Maine Department of Environmental Protection, Air Emission License Issued to Regional Waste System, Inc., Portland, Maine (February 12, 1986) at 31; County of San Diego Air Pollution Control District, Authority to Construct the San Marcos North County Resource Recovery Center (November 30, 1984) at 5; Illinois Environmental Protection Agency, Construction Permit Issued to Kirby-Coffman, Inc. (October 1, 1987) at 2; Virginia State Air Pollution Control Board, Permit for the Fairfax County Facility (January 12, 1987) at 2.
3. Barry Mannis, Vice President, Waste to Energy Analyst Shearson Lehman Hutton, per.com. 20 Sept., 1989.
4. Kidder Peabody, "The Waste to Energy Industry," July, 1989.
5. Office of Science and Technology, Swedish Embassy, "Environmental Requirements for Refuse Firing" (June 1986).
6. Denmark Environmental Department, "Guide About Limits of Pollution From Garbage Burning Plants" (May 1, 1986) (PCDD and PCDF emissions, annual average not to exceed 1 ng 2,3,7,8 TCDD equivalent).
7. Olle Aslander, "The Swedish Dioxin Moratorium," ASCE Dioxin Symposium, New York City (February 10, 1987).
8. National Incinerator Testing Evaluation Program Report, Environment Canada at 44.
9. Ronald Zurlinden, Henry Von Dem Fang, Jeffrey Hahn, Environmental Test Report Regarding Marion County Solid Waste-To-Energy Facility (November 21, 1986) at 6.
10. Hershkowitz, A. Garbage Burning Lessons from Europe, (New York: INFORM) at 27.

11. Michigan guidelines. Currently, no combustion training institute exists anywhere in the nation, despite the fact that the chief executive officer of one of the nation's largest incinerator manufacturers, Ogden-Martin, has publicly stated that successful incineration involves "40% hardware and 60% operations" and personnel. Paper presented by David Sokol, Chief Executive Officer, Ogden-Martin, at Shearson-Lehman First Annual Pollution Congtol Conference, New York City (December 11, 1987).

To be sure, the legislature has directed the New York State Energy Research and Development Authority to establish a training center for incinerator operators. Laws of 1987, Ch. 615, §21. But this facility is not yet operational. Moreover, on-going efforts of the American Society of Mechanical Engineers to establish worker training standards are limited to two positions - shift supervisor and chief facility operator. But other incinerator employees, including control room personnel, tip floor operators, and crane operators, also perform critical tasks that warrant comprehensive training.



October 5, 1989

Corporate Place
55 Fenwick Road
Danvers, MA 01923
Tel (508) 777-2207
Fax (508) 774-6199

The Honorable Max Baucus
Chairman, Environmental Protection
Subcommittee
Committee on Environment and Public Works
415 Senate Hart Office Building
Washington, DC 20510

Re: Submission for Hearing
Record on S. 196

Dear Senator Baucus:

On behalf of Wheelabrator Environmental Systems, Inc., I am pleased to submit comments on S. 196, the Municipal Waste Combustion Control Act of 1989. I hope that these comments will be made part of the permanent hearing record for the Environmental Protection Subcommittee hearing on S. 196, held on September 21, 1989.

Wheelabrator would like to take this opportunity to express its support for the bill, and to suggest that some changes are necessary. We are eager to help develop an integrated, responsible policy that uses waste-to-energy technology as one solid waste management option in an environmentally safe manner.

We wish to point out that while all of our comments address significant provisions, some present major substantive issues while others provide only technical changes or clarification. Most importantly, we would draw your attention to the comments which modify the carbon monoxide emissions standard, defer solid waste planning issues to RCRA reauthorization, and address issues related to new standards for existing facilities.

While we hope the comments are self-explanatory, we think they are important enough to merit further discussion. To that end, we would appreciate the opportunity to discuss them with your staff in the near future.

Thank you again for granting Wheelabrator the opportunity to enter our comments into the hearing record.

Sincerely,

A handwritten signature in cursive script that reads "Richard F. Anderson".

Richard F. Anderson, Ph.D.
Director of Government Affairs

Enclosure

Comments on S. 196 Municipal Waste Combustion Control Act

Air Issues

1. Provision
p. 3 l. 24-25 and p. 4 l. 1-2 § 129 (a) (1) (D)

The language in this section is intended to identify practices and control technologies that can be used individually or in combination as BACT. We have no argument with the named air pollution control equipment. We have a serious concern, however, with lines 24 and 25 which state, "... or in combination with other available practices or control technologies not identified in this paragraph, shall be deemed available for purposes of this paragraph:", (underlined added).

Issue

The issue is that the language underlined significantly expands EPA's authority to require virtually any practices to be imposed at any new facility. For example, this language gives EPA authority to require source separation as a BACT, and such a practice would be automatically considered as "deemed available."

Suggested Change

Insert the following language on page 4, line 2, after "paragraph"

" , if such practices or control technologies can be technically demonstrated, and after consideration of cost and energy requirements"

2. Provision
p. 5 l. 13-23 § 129 (1) (2) (B) (i)

This provision sets a hammer standard for new facilities for CO emissions at 50 ppm, corrected to 7% O₂ on a 4-hour average.

Issue

A thorough review of data from Millbury's CO CEM indicates that average CO emissions are between 35-38 ppm under normal operating conditions. Millbury occasionally exceeds 50 ppm on a 4-hour rolling average under normal operating conditions. Significant exceedances occur during start-up and shut-down for scheduled maintenance and process interruptions. Other new plants (e.g., Bridgeport, Concord, etc.) are likely to exceed the

50 ppm standard as well. This standard is too stringent, and even modern state-of-the-art units will experience a substantial non-compliance record if the standard is not changed.

Suggested Change

Option 1

Change 50 to 100 ppm

Option 2

Keep 50 ppm as the standard, but insert the following language on page 5, line 23 after the word "filtration;"

"during periods of start-up and shut-down related to scheduled and unscheduled maintenance outlet gas concentration may exceed 50 ppm"

3. Provision

p. 8 l. 3-17 §129 (b) (1)

This provision would require each jurisdiction that would send waste to a facility (in town or out of town) to develop and approve an "enforceable solid waste management plan" before a facility could be granted an air permit.

Issue

This type of planning requirement ultimately results in a moratorium on facility development. Furthermore, it seeks to lock communities into rigid plans that are litigable. Such plans have no flexibility and cannot adapt to the constant ebb and flow of changing market conditions.

Suggested Change

Remove all planning requirements from S.196 and ensure that they be dealt with in RCRA where the jurisdictional responsibility squarely lies.

4. Provision
p. 12 l. 7-18 §129 (d)

The hammer for emission standards applied to existing facilities employs a compliance schedule not to exceed six years.

Issue

The hammer provisions for existing facilities would require acid gas controls of 70% removal or 60 ppm for SO₂, and 90% removal or 45 ppm for HCl. These emission limits would entail scrubber retrofits. Experience with Saugus suggests that a six year retrofit compliance schedule would be unrealistic to meet; especially if five Wheelabrator plants were required to all retrofit in that short time frame.

Suggested Change

Strike "six" on page 12, line 9, and replace it with "ten".

5. Provision
p. 11-12, § 129 (d)

This entire provision sets emission standards as hammer provision for existing facilities.

Issue

The hammer standards proposed for existing facilities would present an unprecedented retrofit burden on the industry. Since there is a lack of substantial and convincing data that such plants present unacceptable health risks, the proposal should forego setting hammer standards and rely on EPA to make case-by-case judgements on whether or not retrofits are necessary.

Suggested Change

Option 1

Strike section (d) which requires changes to existing facilities.

Option 2

Strike section (d) and comment that EPA is now setting emission guidelines under CAA section 111(d), and there is no need for statutory language on this issue.

6. Provision

p. 17 l. 5-8 and 15-17 § 129 (f) (2)

This provision would allow EPA or states to require improvements to facilities every five years, where the improvements do not exceed "minimal cost" (defined as not more than 5% of actual capital cost of the unit).

Issue

This provision introduces an unprecedented authority to EPA to require retrofit of new facilities based on technology availability. EPA already has authority to require such retrofits if they identify an imminent threat to public health. The current proposal is not driven by health concerns. It would also result in a 15% additional capital cost for such retrofit (based on a 20 year permit, and 5% retrofits every five years starting with year five). Such additional costs would alter current financial underwriting practices, and result in higher costs to municipalities choosing resource recovery options.

Suggested Change

Option 1

Strike subsection (f) (2) page 17, lines 5-8 and 15-17.

Option 2

Insert after "permit" on page 17, line 8 the following language "where the Administrator has determined that such additional conditions are necessary to protect public health and the environment"

7. Provision

p. 22 l. 3-9 and 19-25 (include p. 23 l. 1-9) § 129 (k) (2) and (4)

Section 129 (k) (2) (A) defines a "new" unit as one that is constructed or modified after the EPA establishes emission standards under this bill when enacted. Standards must be promulgated within 18 months of enactment. Then, section 129 (k) (4) defines a "modified" facility as one where modifications exceed 50% of original capital cost (minus land cost), or where the amount of any air pollutant is increased.

Issue

- A. The Wheelabrator Saugus experience suggests that modification costs can easily exceed 50% of original capital cost. Therefore, through a drafting oversight, all existing facilities that are retrofitted may be inadvertently defined as a new facility. New facilities must comply with a different, and more stringent, set of emission standards.

- B. Subsection (B) of § 129 (k) (4) qualifies a modified facility as one where "... a physical change in or change in the method of operation of the unit increases the amount of any air pollutant emitted... for which standards have been established under this section." If existing facilities are required to comply with new standards of operation or retrofit air pollution control equipment the profile of air emission may be altered. If changes in control equipment increase or decrease NO_x , CO, etc there is no relief from the stringency of this section.

Suggested Change

Language should be inserted that clarifies the intent that modifications as a result of new compliance requirements do not inadvertently classify existing facilities as new facilities.

Ash Issues

8. Provision
p. 28 l. 14-17 § 4011 (b) (1) (A)

Landfills where ash is cofilled with trash require a minimum of a double composite liner and two leachate collection systems.

Issue

This provision is objectionable for practical and precedential reasons.

Practical Argument

The brief introduction of the double composite liner as a design approach does not offer sufficient field data to conclude that it is an effective means of preventing leachate migration. In fact, the introduction of a compacted clay liner as part of an upper composite liner may damage the integrity of a lower flexible membrane liner and seriously impair the lower leachate collection system.

Precedent Argument

A double composite liner exceeds the requirements of a double liner called for under RCRA Subtitle C hazardous waste regulations. Thus, the minimum cofill requirement raises the floor for solid waste above the ceiling for hazardous waste. This presents serious definitional problems for ash compared to hazardous waste. Rather than being regulated as a special solid waste, the double composite requirement would regulate cofills as a special hazardous waste.

Suggested Change

Option 1

Strike the word "composite" from page 28, line 14.

Option 2

Replace the language "... two or more composite liners" on page 28, lines 14-15 with the following language "a double liner consisting of one flexible membrane liner and a composite liner with leachate collection systems above and between such liners."

9. Provision

p. 29 1. 1-3 § 4011 (b) (2)

This provision states design specifications for a composite liner. The natural liner has a minimum acceptable standard of a three foot thick layer of recompacted clay or other natural material with a hydraulic conductivity of no more than 1×10^{-7} cm/sec.

Issue

A liner design specification should be developed from site specific environmental and engineering analysis and result from permit writer discussions with the permit applicant. The provision, as written ignores this necessity. We object to the three foot thickness and natural material designations. The provision should rely on the performance standard that a flexible membrane liner and bottom liner meet the limits of 1×10^{-7} cm/sec permeability.

Suggested Change

Strike the following language on page 28, line 25 and page 29, lines 1-2: "... at least a 3-foot thick layer of recompacted clay or other natural material".

Insert the following language in its place: "... a bottom layer liner of clay or other natural material or fabricated material".

10. Provision

p. 30 1. 3-16 § 4011 (b) (4)

This provision allows for use of alternative designs for the single and double composite liner requirements. Lines 10-12 impose the caveat that a state granting a waiver cannot rely "solely or substantially" on location characteristics to grant a waiver.

Issue

We agree that waivers should not be granted "solely" on the basis on location characteristics. It is equally important to show that engineering design and operation standards are protective.

We object to the prohibition on "substantially" relying on location characteristics to grant a waiver. Take, for example, the Saugus and Pinellas ash disposal facilities where location characteristics play an important role in ash fill operations and remediation plans.

Suggested Change

Strike the words on page 30, lines 10-11: "... not solely or substantially rely upon location characteristics".

Replace with the following language: "... consider location characteristics, engineering design and controls, operational practice, and other factors."

11. Provision

p. 32 l. 17 § 4011 (d) (1); and
p. 34 l. 14 § 4011 (e) (1)

Both of these provisions require that ash routinely pass testing criteria for reuse and recycling as well as "test-out" disposal in a sanitary landfill. The provision directs EPA to consider all exposure pathways. The EPA is directed to set "at a minimum" test methods "... to determine leaching, total chemical analysis, respirability and toxicity".

Issue

EPA is not likely to come up with a testing protocol for respirability. The other minimum requirements can be met, and are similar to what can be done today.

Respirability tests are technically outside the EPA's domain. Respirability, with regard to ash handling is an OSHA concern; and, with regard to ash reuse, is a consumer product safety concern. The Agency is clearly not in a position to develop such a testing criterion in a timely and adequate manner.

Suggested Change

Strike the word "respirability" from page 32, line 17 and page 34, line 14.

12. Provision

p. 33 1. 13-17 § 4011 (c) (3)

This provision prohibits ash reuse and recycling three years after enactment if EPA fails to promulgate regulation, unless the ash is treated and an EP Tox test is applied and metals concentrations do not exceed primary drinking water standards under Section 1412 of the Safe Drinking Water Act.

Issue

EPA is not likely to come up with a test (as suggested in #11 above), in a timely manner. The requirement, as written, raises concerns for plans to reuse ash in road beds, artificial reefs and as a landfill intermediate and final cover. The proposed language is too strict. It is appropriate to find some middleground. For example, all ash should not be required to be treated and meet primary drinking water standards if it will be used as interim or final cover in landfills.

Suggested Change

Insert the following language on page 33, line 13 after the word "... unless". "... the Administrator determines that such ash should be treated".

Strike the words "... such ash is treated".

Insert the following language on page 33, line 17 after "... contaminant". "The Administrator may require that ash that is not treated may be reused or recycled if, based on extraction procedure toxicity test such ash is less than 100 times the section 1412 Safe Drinking Water Act standards, and an owner or operator can demonstrate that such reuse or recycling does not pose a danger to public health or the environment".

13. Provision

p. 38-43 § 4011 (j) et al

This provision outlines the solid waste management plan.

Issue

Similar to the planning provision under section 129 in the "air" portion of the bill, this provision is impractical and will only result in moratoria and plans that fail to meet mandates and objectives.

Suggested Change

Require that solid waste management planning be considered during RCRA reauthorization discussions, but not as part of the Clean Air Act.

S. 196

IN THE SENATE OF THE UNITED STATES

Mr. BURDICK (for himself, Mr. DUBENBERGER, and Mr. MOYNIHAN) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

A BILL

1 *Be it enacted by the Senate and House of Representa-*
2 *tives of the United States of America in Congress assembled,*

SECTION 1. This Act may be cited as the "Municipal Waste Combustion Control Act of 1989".

SEC. 2. (a) Part A of title I of the Clean Air Act is amended by adding the following new section:

1 "MUNICIPAL WASTE COMBUSTION

2 "SEC. 129. (a)(1)(A) Not later than eighteen months
3 after the date of enactment of this section, the Administrator
4 shall promulgate standards of performance to control emis-
5 sions of air pollutants into the ambient air from each—

6 "(i) new or modified municipal waste incineration
7 unit; and

8 "(ii) municipal waste incineration unit which
9 begins operation after July 1, 1989 except units which
10 are substantially completed before such date.

11 "(B) The standards promulgated under this subsection
12 shall reflect the greatest degree of emission limitation achiev-
13 able through application of the best available control technol-
14 ogies and practices which the Administrator determines at
15 the time of promulgation (or revision, in the case of a revision
16 of a standard)—

17 "(i) has been achieved in practice by a municipal
18 waste incineration unit, excluding periods of malfunc-
19 tion or misoperation, or

20 "(ii) is contained in a State or local regulation or
21 any permit for municipal waste incineration units, and
22 will be implemented at such units,

23 whichever is more stringent, unless the Administrator deter-
24 mines that such degree of emission limitation will not be
25 achievable by units to which the standards apply or was

1 adopted for reasons that are unique to the unit or jurisdiction
2 in which the unit is located and are not applicable to other
3 units or jurisdictions. In determining the emissions limitation
4 to be required under this subsection, the Administrator shall
5 take into account the performance of all units which achieve,
6 in whole or in part, emissions limitations more stringent than
7 current standards and may subsequently exclude units from
8 consideration only to the extent provided in this subpara-
9 graph. In establishing standards under this section the Ad-
10 ministrator may distinguish between types and classes of mu-
11 nicipal waste incineration units based on combustion technol-
12 ogy or pollution control systems.

13 “(C) In no event shall the standards promulgated under
14 this subsection permit such municipal waste incineration units
15 to emit any pollutant in excess of the amount allowable under
16 any applicable new source standards of performance.

17 “(D) Standards under this subsection shall be based on
18 methods and technologies for removal or destruction of pol-
19 lutants before, during, or after combustion, and shall incorpo-
20 rate citing requirements that minimize, on a site specific
21 basis, to the maximum extent practicable, any potential risk
22 to human health or the environment. The following practices
23 and control technologies, used individually, in combination
24 with one another, or in combination with other available
25 practices or control technologies not identified in this para-

1 graph, shall be deemed available for purposes of this para-
2 graph: electrostatic precipitators, fabric filtration, flue gas
3 scrubbers, spray dry scrubbers, negative air flow, and good
4 combustion practices, including availability of auxiliary fuel
5 to maintain specific temperatures.

6 “(E) In adopting standards of performance, the Admin-
7 istrator may take into consideration other technologies and
8 practices that, either by themselves or in combination with
9 other technologies or practices, may achieve a greater degree
10 of emission reduction for the pollutants specified in paragraph
11 (2)(A), including the use of selective or nonselective catalytic
12 reduction, wet flue gas denitrification, selective noncatalytic
13 reduction, wet scrubbing, or catalytic oxidation. The Admin-
14 istrator may require new facilities to be constructed accord-
15 ing to designs which allow for addition of selective catalytic
16 reduction, and other technologies, as they become available,
17 except that selective catalytic reduction may not be required
18 by the Administrator at municipal waste incineration units
19 which have installed flue gas treatment for control of emis-
20 sions of oxides of nitrogen prior to the date of enactment of
21 this section.

22 “(2)(A) The standards promulgated under this subsec-
23 tion shall specify numerical emission limitations for the fol-
24 lowing substances or mixtures: particulate matter (total and
25 fine), opacity, sulfur dioxide, hydrogen chloride, oxides of ni-

5

1 trogen, carbon monoxide, lead, cadmium, mercury, haloge-
2 nated organic compounds, dioxins, and dibenzofurans. In es-
3 tablishing such standards of performance under this subsec-
4 tion, the Administrator shall take into account the use of nu-
5 merical standards or other methods to reduce the presence in
6 air emissions or ash from a municipal waste incineration unit
7 of each of the following additional substances; volatile organ-
8 ic compounds, beryllium, hydrogen fluoride, antimony, ar-
9 senic, barium, chromium, cobalt, copper, nickel, selenium,
10 zinc, polychlorinated biphenyls, chlorobenzenes, chlorophen-
11 ols, and polynuclear aromatic hydrocarbons.

12 “(B) In no event shall any such standard allow—

13 “(i) an outlet gas carbon monoxide concentration
14 greater than 50 parts per million corrected to 7 per
15 centum oxygen on a four-hour average except that the
16 Administrator is authorized to establish a standard for
17 refuse-derived fuel units allowing carbon monoxide con-
18 centrations not to exceed 100 parts per million correct-
19 ed to 7 per centum oxygen on a four-hour average pro-
20 vided that such units commencing construction or
21 modification after the date of enactment of this section
22 control emissions with dry scrubbers and fabric filtra-
23 tion;

6

1 “(ii) an outlet gas particulate concentration great-
2 er than 0.015 grains per dry standard cubic foot cor-
3 rected to 7 per centum oxygen;

4 “(iii) an outlet gas concentration of sulfur dioxide
5 greater than 40 parts per milion corrected to 7 per
6 centum oxygen on an eight-hour average, unless un-
7 controlled emissions of sulfur dioxide are reduced by
8 not less than 70 per centum;

9 “(iv) an outlet gas concentration of hydrogen chlo-
10 ride greater than 30 parts per million corrected to 7
11 per centum oxygen on an eight-hour average, unless
12 uncontrolled hydrogen chloride emissions are reduced
13 by not less than 90 per centum; or

14 “(v) a retention temperature and time of less than
15 1800 degrees Fahrenheit or less than one second at
16 fully mixed height (or the equivalent), except that the
17 Administrator may establish standards for combustion
18 parameters (including temperature) other than those
19 stated in this paragraph for units employing atmospher-
20 ic-fluidized bed boilers for the control of oxides of ni-
21 trogen; *Provided*, That such standards achieve a com-
22 bustion efficiency equivalent to that required of other
23 units.

24 “(3) Standards promulgated under this subsection shall
25 be effective no later than six months after the date of promul-

1 gation. To the extent that installation of an acid gas scrubber
2 at a municipal waste incineration unit is required to comply
3 with a standard or standards under this subsection, such
4 standard shall be effective for units at which a scrubber is to
5 be installed not later than twenty-four months after the date
6 of promulgation. Not later than five years following the initial
7 promulgation of such standards and at five-year intervals
8 thereafter, the Administrator shall review and, in accordance
9 with this subsection, revise such standards. Such revised
10 standards shall be effective as of the date six months after the
11 date of promulgation with respect to facilities which begin
12 construction or modification on or after the date on which
13 such standards are first proposed.

14 “(4) After the effective date of any standard promulgat-
15 ed under this section, it shall be unlawful for any owner or
16 operator of any municipal waste incineration unit to operate
17 such unit in violation of such standard applicable to such unit.

18 “(5) When promulgating standards (or revised stand-
19 ards) under this subsection the Administrator shall consider
20 the applicability of such standards (as the result of subsection
21 (k)(2)(B)) to municipal waste incineration units already in op-
22 eration and shall publish with such standards a schedule for
23 compliance for each such unit providing adequate time for
24 retrofit of necessary pollution control equipment, but in no

1 event longer than four years after the date standards are pro-
2 mulgated.

3 “(b)(1) In addition to any other applicable requirements,
4 after the date twenty-four months after the enactment of this
5 section, no permit may be issued under a State program ap-
6 proved under part C or part D of this Act for any new or
7 modified municipal waste incineration unit unless (A) the ap-
8 plicant has fully complied with the application requirements
9 for the permit (pursuant to 40 C.F.R. 52.21) and any appli-
10 cable State requirements before such date, or (B) each of the
11 jurisdictions served by the municipal waste incineration unit
12 (as designated by the State in accordance with section 4006
13 of the Solid Waste Disposal Act) has prepared, after notice
14 and opportunity for public comment and public hearing, and
15 submitted to the appropriate State official an enforceable
16 solid waste management plan, in accordance with section
17 4003 and 4011 of the Solid Waste Disposal Act.

18 “(2)(A) Beginning twenty-four months after the date of
19 enactment of this section, no permit may be issued under this
20 Act to a municipal waste incineration unit unless an ash
21 management plan has been submitted for the ash from such
22 unit. The application for each permit to be issued to a new or
23 modified municipal waste incineration unit or renewal or issu-
24 ance of a permit for an existing unit, shall include a reasona-
25 ble demonstration of adequate capacity to treat, manage, or

1 dispose of the ash produced by the unit for a period of not
2 less than five years in compliance with the requirements of
3 section 4011 of the Solid Waste Disposal Act. Demonstra-
4 tions required by this paragraph shall be updated every five
5 years as required by subsection (f).

6 “(B) The Administrator may promulgate regulations or
7 issue guidelines for the implementation of this paragraph
8 which shall provide that, to the extent practicable, demon-
9 strations are based on the characteristics of ash from the mu-
10 nicipal waste incineration unit as determined by testing meth-
11 ods prescribed pursuant to section 4011 of the Solid Waste
12 Disposal Act. The initial demonstration required for new or
13 modified municipal waste incineration units under this para-
14 graph shall be based on the characteristics of the ash from
15 units of comparable design (including pollution control equip-
16 ment and ash treatment systems) combusting similar waste
17 streams.

18 “(C) Notwithstanding any other provision of this Act or
19 the Solid Waste Disposal Act, no person may operate a mu-
20 nicipal waste incineration unit unless adequate capacity is
21 available to treat, manage or dispose of the ash produced by
22 the unit in compliance with section 4011 of the Solid Waste
23 Disposal Act.

24 “(c) If the Administrator fails to promulgate standards
25 under subsection (a) of this section, beginning eighteen

1 months after the date of enactment of this section and ex-
2 tending until such time as standards are promulgated no
3 permit may be granted to the owner or operator of any mu-
4 nicipal waste incineration unit which begins operation after
5 July 1, 1989 and which is required to obtain a permit under
6 a State program approved under part C or part D of this Act
7 unless such permit requires compliance with emission stand-
8 ards that comply with subsection (a)(2)(B). Compliance with
9 standards promulgated under subsection (a) shall be required
10 six months after the date such standards are promulgated for
11 all municipal waste incineration units subject to the provi-
12 sions of this subsection, unless a unit is required to install an
13 acid gas scrubber to comply with a standard in which case
14 the standard shall be effective for such unit no later than
15 twenty-four months after promulgation.

16 “(d) Not later than eighteen months after the enactment of
17 this section, the Administrator shall promulgate regulations
18 and standards of performance to control emissions of air pol-
19 lutants into the ambient air from each municipal waste incin-
20 eration unit which is in operation or which is substantially
21 completed prior to January 1, 1989. Such standards of per-
22 formance shall be established on the basis of the degree of
23 emission limitation achievable through application of avail-
24 able control technologies and practices as determined under
25 subsection (a)(1), and shall specify emission limitations for the

1 substances required under subsection (a)(2). In establishing
2 standards under this subsection the Administrator may distin-
3 guish between types and classes of municipal waste inciner-
4 ation units based on combustion technology or pollution con-
5 trol systems. In no event shall any such standard allow—

6 “(1) an outlet gas carbon monoxide concentration
7 greater than 100 parts per million corrected to 7 per-
8 cent oxygen on an eight-hour average except that the
9 Administrator is authorized to establish a standard for
10 units allowing carbon monoxide concentrations not to
11 exceed 200 parts per million corrected to 7 per centum
12 oxygen on an eight-hour average provided that such
13 units control emissions with acid gas scrubbers and
14 fabric filtration;

15 “(2) an outlet gas particulate concentration great-
16 er than 0.020 grains per dry standard cubic foot cor-
17 rected to 7 per centum oxygen;

18 “(3) an outlet gas concentration of sulfur dioxide
19 greater than 60 parts per million corrected to 7 per
20 centum oxygen on an eight-hour average, unless un-
21 controlled emissions of sulfur dioxide are reduced by 70
22 per centum;

23 “(4) an outlet gas concentration of hydrogen chlo-
24 ride of 45 parts per million corrected to 7 per centum
25 oxygen on an eight-hour average, unless uncontrolled

1 emissions of hydrogen chloride are reduced by 90 per
2 centum; or

3 “(5) a retention temperature and time of less than
4 1800 degrees Fahrenheit or less than one second at
5 fully mixed height (or the equivalent).

6 The Administrator shall promulgate a schedule for compli-
7 ance with these standards. In no event shall such schedule
8 provide for compliance with such standards later than the
9 date six years after the enactment of this section, except that
10 facilities which will be required to meet standards established
11 under subsection (a) (as a result of subsection (k)(2)(B)) within
12 three additional years of such date may be allowed a variance
13 from the compliance schedule of this section during such
14 three-year (or shorter) period provided that the owner or op-
15 erator of any unit seeking a variance certifies that compliance
16 with standards established under subsection (a) will be
17 achieved on and after the date applicable under subsection
18 (a).

19 “(e)(1) The Administrator shall promulgate regulations
20 requiring the owner or operator of each municipal waste in-
21 cineration unit—

22 “(A) to monitor emissions from the unit at the
23 point at which such emissions are emitted into the am-
24 bient air (or within the stack, combustion chamber, or
25 pollution control equipment, as appropriate) and at

1 such other points as necessary to protect human health
2 and the environment;

3 “(B) to monitor such other parameters relating to
4 the operation of the unit and its pollution control tech-
5 nology as the Administrator determines are appropri-
6 ate; and

7 “(C) to report the results of such monitoring.

8 Such regulations shall contain provisions regarding the fre-
9 quency of monitoring, test methods and procedures validated
10 on municipal incineration units, and the form and frequency
11 of reports containing the results of monitoring and shall re-
12 quire that any monitoring reports or test results indicating
13 exceedance of standards under this section shall be reported
14 separately and in a manner that facilitates review for pur-
15 poses of enforcement actions. Such regulations shall require
16 that copies of the results of such monitoring be maintained on
17 file at the facility concerned and that copies shall be made
18 available for inspection and copying by interested members of
19 the public during business hours.

20 “(2) The Administrator shall promulgate the regulations
21 required under this subsection within eighteen months after
22 the enactment of this section. Such regulations may be re-
23 vised from time to time in accordance with paragraph (1).
24 Except as provided in paragraph (3), the requirements of this
25 subsection shall take effect—

1 “(A) upon commencement of operation of any new
2 or modified unit; and

3 “(B) twenty-four months after the enactment of
4 this part in the case of any existing municipal waste
5 incineration unit.

6 “(3)(A) The regulations promulgated under this subsec-
7 tion shall, at a minimum, require continuous monitoring for
8 the following: opacity, hydrogen chloride (if such monitoring
9 device or method is available), sulfur dioxide, oxides of nitro-
10 gen, carbon monoxide, carbon dioxide, oxygen, stack temper-
11 ature, furnace temperature (or secondary combustion zone
12 temperature, as appropriate) and stack gas temperature at
13 the inlet to the particulate control device.

14 “(B) For all emissions subject to standards under this
15 section that are not subject to continuous monitoring under
16 subparagraph (A), the regulations promulgated under this
17 subsection shall require periodic monitoring of such emissions
18 at each municipal waste incineration unit not less frequently
19 than—

20 “(i) every six months, or

21 “(ii) six months after commencement of oper-
22 ations, and every eighteen months thereafter if the
23 owner or operator of such unit demonstrates that such
24 unit has complied with all applicable emissions stand-
25 ards as of the commencement of operations and during

1 the previous periods of monitoring and maintains com-
2 pliance with all applicable emissions standards during
3 each interval between monitoring.

4 Regulations promulgated under this section shall provide for
5 prompt monitoring of emissions and parameters which are
6 not monitored continuously whenever there is a violation of a
7 related emission standard or parameter which is continuously
8 monitored.

9 "(C) The initial monitoring under this subsection shall
10 commence at the later of the following—

11 "(i) the date six months after the promulgation of
12 regulations under this subsection; or

13 "(ii) the commencement of operation of the unit
14 concerned.

15 "(4) Notwithstanding the provisions of paragraph (3),
16 regulations promulgated under this subsection and applicable
17 to municipal waste incineration units which are not major
18 emitting facilities as defined in part C may provide for moni-
19 toring with other than EPA-certifiable monitoring methods
20 and shall at a minimum require continuous monitoring of:
21 oxygen, opacity; furnace temperature (or secondary combus-
22 tion zone temperature, as appropriate); carbon monoxide; pH;
23 and such other parameters as the Administrator shall require.

24 "(5)(A) The regulations required by this subsection may
25 require the owner or operator of each municipal waste incin-

1 eration unit to establish and operate, or to pay the costs of
2 establishing and operating, a program to detect impacts of
3 the unit, or any associated releases, on the environment or
4 human health. Such program shall require periodic testing for
5 and public reporting of the presence of waste constituents or
6 contaminants (or indicators thereof) at statistically significant
7 levels.

8 “(B) In any case in which exposure to municipal waste
9 incineration unit emissions or ash may pose a potential risk to
10 human health, the Administrator or the State may request
11 the Administrator of the Agency for Toxic Substances and
12 Disease Registry to conduct a health assessment in connec-
13 tion with the unit and such other health studies or surveil-
14 lance as may be warranted, as authorized under section
15 104(i) of the Comprehensive Environmental Response, Com-
16 pensation and Liability Act of 1980. Such studies may in-
17 clude programs to detect changes in the body burden of vari-
18 ous pollutants including but not limited to lead, mercury, cad-
19 mium, halogenated hydrocarbons, and dioxins in any area af-
20 fected by incineration unit emissions or ash.

21 “(f) Notwithstanding any other provision of this Act,
22 each permit for a municipal waste incineration unit issued
23 under this Act may be issued for a period of up to twenty
24 years and shall be reviewed every five years after date of
25 issuance or reissuance. Each permit shall continue in effect

1 after the date of issuance until the date of termination, unless
2 the Administrator or State determines—

3 “(1) that the unit is not in compliance with all
4 standards and conditions contained in the permit;

5 “(2) that compliance with additional conditions
6 will impose minimal costs on the owner or operator of
7 the unit and such conditions will reduce air emissions
8 below levels specified in the permit, or

9 “(3) capacity to treat or dispose of the ash from
10 such unit in compliance with section 4011 of the Solid
11 Waste Disposal Act for a five-year period after such
12 determination has not been demonstrated.

13 Such determination shall be made at regular intervals during
14 the term of the permit, such intervals not to exceed five
15 years, and only after public comment and public hearing. For
16 purposes of this subsection, the term “minimal costs” shall
17 not exceed five percent of the actual capital costs of the unit.
18 No permit for a municipal waste incineration unit may be
19 issued under this Act by an agency, instrumentality or person
20 (other than a Governor) that is also responsible, in whole or
21 part, for the design and construction or operation of the unit.
22 Notwithstanding any other provision of this subsection, the
23 Administrator or State may require the owner or operator of
24 any unit to comply with emissions limitations or implement
25 any other measures, if the Administrator or State determines

1 that emissions in the absence of such limitations or measures
2 may reasonably be anticipated to endanger public health or
3 the environment.

4 “(g)(1) Nothing in this section shall diminish or other-
5 wise affect any authority to establish and enforce standards
6 under section 111 or 112 or under any other authority of law
7 for emissions from municipal waste incineration units of any
8 air pollutant not referred to in subsection (a). With respect to
9 emissions from municipal waste incineration units of any air
10 pollutant referred to in subsection (a)—

11 “(A) nothing in this section shall diminish the au-
12 thority of the Administrator to promulgate more strin-
13 gent standards under section 112 or any other provi-
14 sion of this Act;

15 “(B) nothing in this section shall diminish the au-
16 thority of the Administrator or a State to establish any
17 other requirements under any other authority of law,
18 including the authority to establish for any such air
19 pollutant a national ambient air quality standard;

20 “(C) no requirement of an applicable implementa-
21 tion plan under section 165 (relating to construction of
22 facilities in regions identified pursuant to section
23 107(d)(1)(D) or (E)) or under section 172(b)(6) (relating
24 to permits for construction and operation in nonattain-

1 ment areas) may be used to weaken the standards in
2 effect under this section; and

3 “(D) nothing in this section shall be interpreted,
4 construed, or applied to limit the authority of the Ad-
5 ministrator to impose more stringent requirements for
6 the incineration of hospital or other infectious wastes
7 under this Act or other authority including subtitle C
8 of the Solid Waste Disposal Act (42 U.S.C. 6921, et
9 seq.).

10 “(2) Nothing in this Act shall be construed, interpreted,
11 or applied to preempt, supplant, or displace other State or
12 Federal law, whether statutory or common.

13 “(h) Any State may submit to the Administrator a pro-
14 posed State program for implementation and concurrent en-
15 forcement of the requirements of this section. Ninety days
16 after submission to the Administrator, the State shall be
17 treated as authorized to enforce the requirements of this sec-
18 tion in such State unless the Administrator determines that
19 the State program does not provide enforcement equivalent
20 to Federal enforcement under this Act. Whenever the Ad-
21 ministrator determines that a State is not enforcing the re-
22 quirements of this section in a manner equivalent to Federal
23 enforcement, the Administrator shall withdraw the authoriza-
24 tion for such State. Each State program approved under this
25 subsection shall, at a minimum, include permitting require-

1 ments for each new and existing municipal waste incineration
2 unit located in the State. Any permit issued by a State may
3 be reviewed and withdrawn by the Administrator on the Ad-
4 ministrator's own motion or upon a showing by any person
5 that the conditions contained in such permit are not in com-
6 pliance with the requirements of this Act.

7 “(i) Nothing in this section shall preclude or deny the
8 right of any State or political subdivision thereof to adopt or
9 enforce any regulation, requirement, or standard relating to
10 municipal waste incineration units that is more stringent than
11 a regulation, requirement, or standard in effect under this
12 section or under any other provision of this Act.

13 “(j) For purposes of sections 111(e), 113, 114, 116,
14 120, 304, and 307 each standard and other requirement pro-
15 mulgated under this section shall be treated in the same
16 manner as a standard of performance under section 111
17 which is an emission limitation and each requirement of a
18 State plan authorized under this section shall be treated as a
19 requirement of an applicable implementation plan. Any civil
20 penalties imposed by a court against a unit of local govern-
21 ment under this Act for violations of this section shall be paid
22 into a trust fund or comparable mechanism established by a
23 court or the State and shall be applied in support of public
24 programs or activities, as authorized by the court (or a fund
25 administrator appointed by the court), that serve to enhance

1 the protection of human health and the environment of the
2 residents of such unit of local government but shall not be
3 used to come up into compliance with requirements estab-
4 lished under this section or section 4011 of the Solid Waste
5 Disposal Act.

6 “(k) As used in this section—

7 “(1) The term ‘municipal waste incineration unit’
8 means a district operating unit of any facility which
9 combusts any solid waste material from commercial or
10 industrial establishments or the general public (includ-
11 ing single and multiple residences, hotels, and motels).
12 Such term does not include incinerators or other units
13 required to have a permit under section 3005 of the
14 Solid Waste Disposal Act. The Administrator may pro-
15 mulgate standards for hospital incineration units (or
16 other units operated principally to handle infectious
17 wastes) under other provisions of this Act or section
18 3005 of the Solid Waste Disposal Act in lieu of stand-
19 ards under this section, provided that such standards
20 are no less stringent than the standards under this sec-
21 tion which are applicable to municipal waste inciner-
22 ation units of a comparable class or type. Until such
23 regulations are promulgated, hospital incineration units
24 (or other units operated principally to handle infectious

1 wastes) shall be subject to the requirements of this sec-
2 tion.

3 “(2) The term ‘new municipal waste incineration
4 unit’ means a municipal waste incineration unit—

5 “(A) the construction or modification of
6 which is commenced after the Administrator pro-
7 poses requirements under this section establishing
8 emissions standards or other requirements which
9 would be applicable to such unit; or

10 “(B) effective January 1, 1992, which had
11 commenced twenty years or more previously.

12 “(3) The term ‘substantially completed unit’
13 means a unit not in operation before July 1, 1989 for
14 which the addition of required pollution control equip-
15 ment will cost more than twice what such equipment
16 would have cost had it been constructed as part of the
17 permitted design or for which 90 per centum of all
18 construction has been completed before such date.

19 “(4) The term ‘modified municipal waste inciner-
20 ation unit’ means a municipal waste incineration unit
21 at which modifications have occurred after the effective
22 date of a standard under subsection (a) or (d) if (A) the
23 cumulative cost of the modifications, over the life of
24 the unit, exceed 50 per centum of the original cost of
25 construction and installation of the unit (not including

1 the cost of any land purchased in connection with such
2 construction or installation), or (B) the modification is a
3 physical change in or change in the method of oper-
4 ation of the unit which increases the amount of any air
5 pollutant emitted by the unit for which standards have
6 been established under this section.

7 “(5) The term ‘existing municipal waste inciner-
8 ation unit’ means a municipal waste unit which is not a
9 new or modified municipal waste incineration unit.

10 “(1)(1) Not later than eighteen months after the enact-
11 ment of this section, the Administrator shall publish guide-
12 lines identifying items or materials that should be removed
13 from municipal waste prior to incineration, either through
14 separation by the generator of such waste or at a central
15 facility from the general waste stream or through limitations
16 on the composition (including inks and pigments) of products
17 or on the disposal of such items or materials in municipal
18 waste.

19 “(2) Regulations under this section shall require the op-
20 erator of any municipal waste incineration unit to establish
21 contractual requirements or other appropriate notification
22 and inspection procedures sufficient to assure that the unit
23 does not receive any waste required to be placed in a facility
24 permitted under section 3005 of the Solid Waste Disposal
25 Act.

1 “(m) If the Administrator finds that there is a reasona-
2 ble basis to conclude that any product or article distributed in
3 commerce presents, or may (to a reasonable degree of cer-
4 tainty) present, a threat to human health or the environment
5 as the result of incineration of such product or article at mu-
6 nicipal waste incineration units which are in compliance with
7 standards promulgated under this section or as the result of
8 the handling or disposal of ash from such units, the Adminis-
9 trator shall by rule apply one or more of the following re-
10 quirements to the composition of such product or article, its
11 distribution in commerce or methods of disposal as may be
12 necessary to protect human health and the environment—

13 “(1) requirements prohibiting or limiting the man-
14 ufacture, processing or distribution in commerce of
15 such product or article;

16 “(2) requirements with respect to the concentra-
17 tion of any substances in the composition of the prod-
18 uct or article including a prohibition on the presence of
19 such substances in the product, article or its residue;

20 “(3) requirements for the marking or labeling of
21 such product or article including instructions for the
22 proper disposal of such product or article or its resi-
23 dues;

1 “(4) requirements for recovering or recycling such
2 products or articles including the imposition of reim-
3 bursable fees on the sale of such product or article;

4 “(5) requirements that solid waste management
5 plans for areas served by municipal waste incineration
6 units as required by subsection (b) of this section pro-
7 vide for the separation, recovery or recycling of such
8 products or articles or residues to prevent, to the maxi-
9 mum extent practicable, any threat to human health or
10 the environment which may result from the inciner-
11 ation of such products, articles or their residues or the
12 handling or disposal of ash from units which have in-
13 cinerated such products, articles or their residues; or

14 “(6) requirements for the disposal of such product
15 or article or its residues.

16 The Administrator shall make a determination under this sec-
17 tion with respect to lead, cadmium and other metals in plas-
18 tics, inks, paints and other products not later than twenty-
19 four months after the date of enactment of this Act.

20 “(n) Not later than eighteen months after the enactment
21 of this section, the Administrator shall develop and promote a
22 model State program for the training and certification of mu-
23 nicipal waste incinerator operators. The program shall in-
24 clude a requirement that all operators achieve a passing
25 grade on an examination on (and participate in continuing

1 education to stay informed about) current technology for the
2 control of pollution from municipal waste incineration units.
3 The Administrator may authorize any State to implement a
4 State program for the training and certification of municipal
5 waste incinerator operators if the State has adopted a pro-
6 gram which is at least as stringent as the model program
7 developed by the Administrator. Beginning on the date thirty
8 months after the date of enactment of this section it shall be
9 unlawful to operate a municipal waste incineration unit
10 unless each person with control over processes affecting
11 emissions from such unit has satisfactorily completed a train-
12 ing and certification program meeting the requirements es-
13 tablished by the Administrator under this subsection.”.

14 (b) Section 169(l) of the Clean Air Act is amended by
15 striking “two hundred and” after “municipal incinerators ca-
16 pable of charging more than”.

17 (c) Section 113 of the Clean Air Act is amended by
18 adding “, 133” after “112(c)” wherever it occurs.

19 ASH MANAGEMENT AND DISPOSAL

20 SEC. 3. (a) Subtitle D of the Solid Waste Disposal Act
21 is amended by adding the following new section:

22 “MUNICIPAL WASTE COMBUSTION ASH

23 “Sec. 4011. (a)(1) Not later than eighteen months after
24 the date of enactment of this section, the Administrator shall
25 promulgate regulations for the management, handling, stor-
26 age, treatment, transportation, reuse, recycling, and disposal

1 of ash from municipal waste incineration units, as may be
2 necessary to protect human health and the environment. Not-
3 withstanding other provisions of this Act, the management,
4 handling, storage, treatment, transportation, reuse, recycling,
5 and disposal of ash from municipal waste incineration units
6 shall be subject to this section and subtitle and not subject to
7 the provisions of subtitle C except that the Administrator
8 may issue regulations under subtitle C in lieu of regulations
9 under this section applicable to ash from units operated pri-
10 marily to incinerate hospital or other infectious wastes. Until
11 such time as regulations are promulgated for such units, ash
12 from units operated primarily to incinerate hospital or other
13 infectious wastes shall be subject to the requirements of this
14 section. The provisions of sections 3007 and 3008 shall apply
15 to ash from municipal waste incineration units and the re-
16 quirements of this section to the same extent that such sec-
17 tions apply to hazardous wastes and the requirements of sub-
18 title C.

19 “(2) For the purposes of this section, the term—

20 “(A) ‘municipal waste incineration unit’ shall have
21 the meaning given in section 131(k)(1) of the Clean Air
22 Act; and

23 “(B) ‘treatment’ means any method, technique, or
24 process designed to change the physical, chemical, or
25 biological character or composition of any ash so as to

1 remove or permanently fix in place any constituent of
2 the ash which, in the event of mismanagement during
3 transportation, storage, reuse, or disposal, would pose
4 a threat to human health or the environment and in-
5 cludes testing of such ash to assure that criteria pro-
6 mulgated under subsection (e) are satisfied.

7 “(3) Regulations promulgated under this section may es-
8 tablish requirements that apply to fly ash separately, to
9 bottom ash separately, or to the combination of fly ash and
10 bottom ash.

11 “(b)(1) Regulations promulgated under subsection (a) for
12 the disposal of ash from municipal waste incineration units in
13 landfills shall require—

14 “(A) the installation of two or more composite
15 liners and a leachate collection system above and be-
16 tween such liners, in accordance with paragraph (2);
17 and

18 “(B) groundwater monitoring.

19 “(2) The requirement of paragraph (1)(A) may be satis-
20 fied by the installation of liners designed, operated, and con-
21 structed of materials to prevent the migration of any constitu-
22 ent into such liners during the period such facility remains in
23 operation (including any post-closure monitoring period). For
24 the purposes of this section the term ‘composite liner’ means
25 a liner which consists of a flexible membrane liner and at

1 least a 3-footthick layer of recompacted clay or other natural
2 material with a hydraulic conductivity of no more than $1 \times$
3 10^{-7} centimeter per second. The provisions of this paragraph
4 apply prior to and after the promulgation of regulations under
5 paragraph (1).

6 “(3)(A) Notwithstanding the requirement of paragraph
7 (1)(A), regulations promulgated under subsection (a) may pro-
8 vide for the placement of ash from municipal waste inciner-
9 ation units to a monofill (containing only ash from such units)
10 with a composite liner designed, operated, and constructed of
11 materials to prevent the migration of any constituent into and
12 through such liner during the period the monofill remains in
13 operation (including any post-closure monitoring period),
14 ground water monitoring and leachate collection.

15 “(B) If fly ash is to be disposed in a monofill containing
16 solely or substantially fly ash, such ash shall be treated pur-
17 suant to treatment standards established under this section
18 before disposal or such monofill shall be constructed with an
19 additional liner and a leachate detection and collection
20 system between the liners.

21 “(C) Requirements under this paragraph are minimum
22 requirements and the Administrator shall promulgate more
23 stringent requirements applicable where necessary to assure
24 that releases from a monofill will not contaminate ground

1 water or surface water or otherwise pose a threat of adverse
2 effects on human health or the environment.

3 “(4) The design requirements of paragraphs (1) and (3)
4 shall not apply if the owner or operator of a solid waste man-
5 agement unit utilizing an alternative design demonstrates to
6 the State, and the State finds, that the alternative design and
7 operating practices will prevent the migration of any hazard-
8 ous constituent into the ground water or surface water at
9 least as effectively as the design requirements of paragraph
10 (1) or (3) of this subsection. The State shall not solely or
11 substantially rely upon location characteristics to make any
12 determination under this paragraph. The Administrator may
13 review, on appeal by any person or on the Administrator’s
14 own motion, and reverse any determination made by a State
15 under this subsection. The Administrator shall make a deci-
16 sion on any appeal within one hundred and eighty days.

17 “(5) Liner requirements imposed under paragraph (2) or
18 (3) of this subsection or subsection (c) shall include provisions
19 for quality control and quality assurance with respect to the
20 design and installation of the liners.

21 “(6) Nothing in this section shall be interpreted, con-
22 strued or applied to require the routine testing of ash which is
23 disposed in a landfill or monofill meeting the requirements of
24 this subsection.

1 “(c) Regulations promulgated under subsection (a) may
2 allow disposal of ash from municipal waste incineration units
3 in sanitary landfills with at a minimum one liner, leachate
4 collection and ground water monitoring and otherwise meet-
5 ing the requirements of revised criteria promulgated under
6 section 4010(c), if (1) such ash is routinely tested and does
7 not fail any criteria under subsection (e); and (2) any fly ash
8 so disposed (including any fly ash combined with bottom ash)
9 has undergone treatment (as defined in subsection (a)) in ac-
10 cordance with regulations for treatment promulgated under
11 this section and such treated fly ash is separately tested and
12 does not fail any criteria established under subsection (e). For
13 the purposes of this section, the mixing of fly ash and bottom
14 ash, or the mixing of such ash with other solid waste, without
15 the introduction of chemical stabilization agents, does not
16 constitute treatment. Ash may not be disposed of in units that
17 are created as a result of vertical expansion of an existing
18 waste disposal facility unless the owner or operator of such
19 facility demonstrates, and the State finds, that there will be
20 no settling (that would impair the integrity of any required
21 liner) of the waste upon which the proposed unit is to be
22 built.

23 “(d)(1) The regulations under this section shall include
24 such requirements applicable to the reuse and recycling of the
25 ash from municipal waste incineration units, including criteria

1 and routine testing procedures, as may be necessary to pro-
2 tect human health and the environment. In developing such
3 regulations, the Administrator shall consider, to the extent
4 feasible and appropriate, all potential pathways of human and
5 environmental exposure, including both short-term and long-
6 term, to hazardous constituents of such ash from such recy-
7 cling and reuse. The pathways to be considered shall include,
8 but not be limited to, inhalation, ingestion as a consequence
9 of incorporation of the ash or any hazardous constituents into
10 the food chain, ingestion of potable water or aquatic orga-
11 nisms contaminated by surface runoff, leaching or percolation
12 of such ash or its hazardous constituents into ground water or
13 surface water, ingestion or inhalation of soil particles con-
14 taminated with such ash, and dermal contact with such ash.
15 At a minimum the Administrator shall consider with respect
16 to such recycling and reuse, appropriate methods to de-
17 termine leaching, total chemical analysis, respirability, and
18 toxicity.

19 “(2) Such regulations shall require treatment of ash
20 from municipal waste incineration units before any such ash
21 is recycled or reused to protect human health and the envi-
22 ronment. Such regulations shall specify those levels or meth-
23 ods of treatment that, taking into account the potential path-
24 ways of exposure identified in paragraph (1)—

1 “(A) substantially reduce the likelihood of migra-
2 tion of ash or its hazardous constituents so that short-
3 term and long-term threats to human health and the
4 environment are minimized;

5 “(B) satisfy any criteria and routine testing proce-
6 dures included in the regulations under paragraph (1);
7 and

8 “(C) assure that the recycling or reuse of such
9 ash is protective of human health and the environment.

10 “(3) If the Administrator fails to promulgate regulations
11 under this subsection, no person may reuse or recycle ash
12 from a municipal waste incineration unit after the date thirty-
13 six months after the date of enactment of this section unless
14 such ash is treated and leachate from an extraction procedure
15 toxicity test applied to such ash does not exceed standards
16 established pursuant to section 1412 of the Safe Drinking
17 Water Act for any pollutant or contaminant.

18 “(e)(1) For the purposes of developing regulations for
19 the management, handling, storage, treatment, transporta-
20 tion, reuse, recycling, and disposal of ash from municipal
21 waste incineration units under this section, the Administrator
22 shall promulgate criteria and testing procedures for identify-
23 ing the characteristics of ash from municipal waste inciner-
24 ation units that may pose a hazard to human health or the
25 environment. In considering potential hazards to human

1 health and the environment, the Administrator shall consider,
2 to the extent appropriate and feasible, all potential pathways
3 of human or environmental exposure to constituents of such
4 ash, including, but not limited to, inhalation, ingestion as a
5 consequence of incorporation of the ash or any constituent
6 into the food chain, ingestion of potable water or aquatic or-
7 ganisms contaminated by surface runoff, leaching or percola-
8 tion of such ash or its constituents into ground water or sur-
9 face water, ingestion or inhalation of soil particles contami-
10 nated with such ash, and dermal contact with such ash (in-
11 cluding, for all such pathways, situations of disposal or
12 reuse). At a minimum, the Administrator shall consider ap-
13 propriate methods to determine leaching, total chemical anal-
14 ysis, respirability, and toxicity. The criteria and accompany-
15 ing testing procedures promulgated by the Administrator
16 under this subsection shall reflect the heterogeneous charac-
17 teristics of municipal solid waste and municipal incinerator
18 ash, including seasonal variations in the constituents of such
19 solid waste and ash. Leaching procedures established under
20 this subsection shall include testing under acidic and native
21 conditions. Test leachate from any ash containing a substance
22 in concentrations exceeding the maximum contaminant level
23 for such substance established pursuant to section 1412 of
24 the Safe Drinking Water Act by a factor of one hundred or
25 more shall, unless the Administrator establishes a more strin-

1 gent requirement, constitute a failure of the test required by
2 this section.

3 “(2) The Administrator shall require the owner or oper-
4 ator of any municipal waste incineration unit or any facility
5 handling, transporting, storing, treating, reusing, recycling,
6 or disposing pursuant to subsection (c) or (d) of ash from such
7 unit to test such ash in accordance with the criteria and test-
8 ing procedures promulgated under this subsection. If fly ash
9 and bottom ash are combined, such combined ash must also
10 be tested in accordance with such criteria and testing proce-
11 dures, including, as the Administrator determines necessary,
12 the separate testing of bottom ash and fly ash.

13 “(3) Any ash which fails in any characteristic under the
14 criteria and testing procedures promulgated by the Adminis-
15 trator under this subsection shall be disposed of in a facility in
16 compliance with subsection (b)(1) or (3), or shall be treated
17 (as defined in subsection (a)) in accordance with regulations
18 promulgated under subsection (a) and shall be demonstrated
19 to satisfy all applicable criteria promulgated under this sub-
20 section before disposal (pursuant to subsection (c)) or reuse
21 (pursuant to subsection (d)).

22 “(4) The Administrator shall seek to validate the crite-
23 ria and testing procedures established pursuant to this sub-
24 section by conducting a program of continuing analysis of

1 leachate produced at facilities disposing or reusing ash from
2 municipal waste incineration units.

3 “(f)(1) Beginning thirty months after the date of enact-
4 ment of this section any facility receiving ash from municipal
5 waste incineration units for the purpose of treatment, stor-
6 age, reuse, recycling, or disposal shall be subject to a permit
7 program or other system of prior approval and conditions
8 comparable to those required by section 4005(c).

9 “(2) Before the issuance of a permit or other prior ap-
10 proval to any person with respect to any facility for treat-
11 ment, storage, reuse, recycling or disposal of incinerator ash,
12 the Administrator or the State shall provide for public notice
13 and the opportunity for an informal public hearing, in accord-
14 ance with the provisions of section 7004(b)(2) of this Act.

15 “(g)(1) Whenever on the basis of any information the
16 Administrator determines that there is or has been a release
17 of any hazardous constituent from a facility regulated under
18 this section, the Administrator may issue an order requiring
19 corrective action or such other response measure as the Ad-
20 ministrator deems necessary to protect human health or the
21 environment or the Administrator may commence a civil
22 action in the United States district court in the district in
23 which the facility is located for appropriate relief, including a
24 temporary or permanent injunction.

1 “(2) Any order issued under this subsection may include
2 a suspension or revocation of authorization to operate, shall
3 state with reasonable specificity the nature of the required
4 corrective action or other response measure, and shall specify
5 a time for compliance. If any person named in an order fails
6 to comply with the order, the Administrator may assess, and
7 such person shall be liable to the United States for, a civil
8 penalty in an amount not to exceed \$25,000 for each day of
9 noncompliance with the order.

10 “(3) Regulations promulgated under subsection (a) shall
11 require corrective action for all releases of hazardous con-
12 stituents from any solid waste management unit at a facility
13 seeking a permit under this section, regardless of the time at
14 which waste was placed in such unit. Permits issued under
15 this section shall contain schedules of compliance for such
16 corrective action and assurances of financial responsibility for
17 completing such corrective action.

18 “(h) Regulations promulgated under subsection (a) shall
19 establish requirements for the proper closure of facilities
20 treating, storing, or disposing of ash from municipal waste
21 incineration units, for the post-closure monitoring and care of
22 such facilities for a period of not less than thirty years, and
23 for assurances of financial responsibility for closure, post-clo-
24 sure care and corrective action.

1 “(i)(1) Beginning eighteen months after the date of en-
2 actment of this section, any State may submit to the Admin-
3 istrator a proposed program for implementation and concur-
4 rent enforcement of the requirements of this section which
5 may be considered and approved by the Administrator in ac-
6 cordance with the procedures established in section 4007.
7 State programs approved under this subsection shall contain
8 provisions assuring that each facility receiving ash from a
9 municipal incineration unit obtains a permit or other form of
10 prior approval as provided in subsection (f). Whenever the
11 Administrator determines that a State is not enforcing the
12 requirements of this section in a manner equivalent to Feder-
13 al enforcement, the Administrator shall withdraw the author-
14 ization of such State program under this subsection.

15 “(2) Nothing in this section shall prohibit any State or
16 political subdivision thereof from imposing any requirement
17 with respect to the management, handling, storage, treat-
18 ment, transportation, reuse, recycling or disposal of ash from
19 municipal waste incineration units which is more stringent
20 than any requirement established under this section.

21 “(j)(1) To the extent that a solid waste management
22 plan is required under section 133(b) of the Clean Air Act
23 and effective twenty-four months after the date of enactment
24 of this section, each jurisdiction served by a municipal incin-
25 eration unit applying for a permit under a State program ap-

1 proved pursuant to part C or part D of the Clean Air Act
2 shall prepare, after notice and opportunity for public com-
3 ment, and submit an enforceable solid waste management
4 plan which is based on an analysis of all solid waste handling
5 alternatives and which, to the maximum extent practicable,
6 (A) minimizes the threat to human health and the environ-
7 ment from solid waste, (B) achieves the conservation of mate-
8 rial resources and protection of human health and the envi-
9 ronment through solid waste reduction, source separation or
10 control, and recycling of not less than 25 per centum of the
11 waste stream by weight as expeditiously as practicable, but
12 in no event later than three years after the adoption of such
13 plan, unless the State finds that such per centum is not eco-
14 nomically achievable and establishes an alternative per
15 centum consistent with the provisions of this subsection.

16 “(2) For purposes of this section the term ‘enforceable
17 solid waste management plan’ means a plan adopted by the
18 State or a local government containing provisions with the
19 force and effect of law or to which the appropriate unit of
20 government is contractually committed, which require, to the
21 extent practicable—

22 “(A) the elimination or reduction of specific
23 wastes or waste constituents (including limitations
24 on the composition of locally produced products,
25 such as products using inks or pigments or prohi-

1 bitions on disposal or certain items in municipal
2 waste) from municipal waste prior to land disposal
3 or incineration, to (i) reduce the risk to human
4 health or the environment posed by any such
5 waste or constituent or its byproducts (whether
6 combustion or otherwise) when present in land
7 disposal, incineration emissions, or incinerator
8 ash, or (ii) facilitate the utilization of safer treat-
9 ment, storage or disposal alternatives;

10 “(B) the separation of wastes at their source
11 or prior to incineration or land disposal to allow
12 the separate treatment and disposal of such
13 wastes, including lead-acid automobile batteries,
14 cathode ray tubes and other concentrated or spe-
15 cialized sources of pollutants including lead, cad-
16 mium, chlorine, mercury, fluorine, dioxins and
17 furans and substances containing them; and

18 “(C) the return to, and acceptance by, retail
19 merchants or their agents, for purposes of pickup
20 and delivery, of waste items the treatment, stor-
21 age or disposal of which can be more effectively
22 or safely effected through such means.

23 “(3) A solid waste management plan required by this
24 section and section 133(b) of the Clean Air Act shall be re-
25 pared by the agency designated by applicable State laws as

1 responsible for the solid waste management planning for the
2 jurisdiction or jurisdictions served or to be served by the mu-
3 nicipal waste incineration unit or, in the absence of such des-
4 ignation, by such jurisdiction or jurisdictions. The agency
5 designated in an enforceable solid waste management plan as
6 the agency responsible for carrying out the plan, or in the
7 absence of such designation, the jurisdiction or jurisdictions
8 shall carry out the plan in accordance with its terms at all
9 times that such plan is in effect.

10 “(4) Solid waste management plans developed pursuant
11 to the requirements of this subsection shall be reviewed and
12 promptly approved or disapproved by the State official with
13 responsibility for administering solid waste management pro-
14 grams. In the event that jurisdictions located in more than
15 one State are served by a municipal waste incineration unit,
16 the Governors of such States may delegate authority to
17 review and approve solid waste management plans as re-
18 quired under this subsection to an interstate planning or re-
19 gional solid waste entity with the capability to assess and
20 oversee the implementation of such plans.

21 “(5) After approval by the appropriate State official of
22 solid waste management plans for all jurisdictions served or
23 to be served by a municipal waste incineration unit as provid-
24 ed in paragraph (4), an application for a permit under a State
25 program approved pursuant to part C or part D of the Clean

1 Air Act for a new or modified municipal waste incineration
2 unit shall not be delayed or denied by a court or any other
3 agency or person having jurisdiction on the basis of the al-
4 leged inadequacy of the enforceable solid waste management
5 plan in effect for the jurisdiction or jurisdictions served or to
6 be served by such unit, or the alleged or proven failure of the
7 responsible agencies to carry out the plan. Such a permit
8 issued while an enforceable solid waste management plan is
9 in effect shall not be suspended, modified or revoked on the
10 basis that, after the permit is issued, the plan is alleged or
11 proven to be inadequate or the agencies responsible to carry
12 out the plan are alleged or proven to have failed to do so. No
13 permit for a municipal waste incineration unit authorized for
14 issuance under the Clean Air Act may be denied, delayed or
15 withdrawn by a court solely on the basis of the inadequacy of
16 a plan or the implementation of a plan required by this sub-
17 section after such plan has been approved by the appropriate
18 State official. Nothing in this paragraph shall be interpreted
19 to preclude the imposition of penalties or the commencement
20 of a suit under section 7002 or enforcement provisions of a
21 State program approved under subsection (i) against a local
22 jurisdiction for any failure to adopt or carry out a solid waste
23 management plan in accordance with this section.

24 “(6) Any civil penalties imposed by a court against a
25 local unit of government for a violation of the section (includ-

1 ing any violation of section 4005(a)) shall be paid into a trust
2 fund or comparable mechanism established by the court or
3 the State and shall be applied in support of public programs
4 or activities, as authorized by the court (or fund administrator
5 appointed by the court), that serve to enhance the protection
6 of human health and the environment of the residents of such
7 local unit of government except that such funds may not be
8 used to come into compliance with the requirements of this
9 section or section 133 of the Clean Air Act.

10 “(7) Not later than twelve months after the date of en-
11 actment of this section, the Administrator shall publish guid-
12 ance which would be useful to States, solid waste planning
13 authorities and jurisdictions served or to be served by munici-
14 pal waste incineration units in the development and imple-
15 mentation of solid waste management plans as required by
16 this subsection.

17 “(k)(1) Export of ash from a municipal waste inciner-
18 ation unit to locations outside of the United States shall be
19 unlawful except as provided in an international agreement
20 between the United States and the country receiving the ash.
21 Any such international agreement shall include at a mini-
22 mum—

23 “(A) a provision for obtaining the consent of the
24 receiving country prior to shipment of the ash;

1 “(B) a provision that requires tracking of the ash
2 shipment from the site of generation to the receiving
3 country;

4 “(C) a provision for cooperation between the
5 United States and the receiving country on compliance
6 and enforcement of the agreement.

7 “(2) No person shall export ash from a municipal waste
8 incineration unit to locations outside of the United States
9 without a permit or other prior approval from the Adminis-
10 trator to do so. Permits granted for export under this section
11 shall have a term not to exceed five years, shall be accompa-
12 nied by fees sufficient to offset the cost experienced by the
13 Administrator in monitoring compliance with the conditions
14 of the permit and shall contain such other requirements as
15 the Administrator may deem appropriate.

16 “(1)(l) Regulations promulgated under this section shall
17 be effective upon promulgation, except that requirements
18 promulgated pursuant to subsection (b) or (c) with respect to
19 the disposal of ash from municipal waste incineration units
20 shall be effective on and after the date forty-eight months
21 after the date of enactment of this section.

22 “(2) Beginning eighteen months after the date of enact-
23 ment of this section and until the effective date of disposal
24 requirements promulgated pursuant to subsection (b) or (c),
25 ash from municipal waste incineration units shall not be dis-

1 posed in landfills unless such landfills have, at a minimum,
2 one liner, leachate collection and ground water monitoring
3 and otherwise meet the criteria for sanitary landfills issued
4 under this subtitle.

5 “(3) Notwithstanding the provisions of paragraph (2),
6 the Administrator or a State may grant on a case-by-case
7 basis a variance from the requirement that ash from each
8 municipal waste incineration unit be disposed in a facility
9 with a liner, leachate collection and ground water monitoring
10 beginning eighteen months after enactment of this section, on
11 a showing by the owner or operator of any such unit that
12 sufficient capacity to dispose of ash in compliance with such
13 requirements is not available for the unit taking cost into
14 consideration. No variance granted under this paragraph
15 shall extend for a period longer than thirty months after the
16 date of enactment of this section.

17 “(4) Notwithstanding the provisions of paragraph (1),
18 the Administrator or a State may grant on a case-by-case
19 basis a variance from the requirement that ash from municipi-
20 pal waste incineration units be disposed only in landfills
21 meeting the requirements of subsection (b) or (c) beginning
22 forty-eight months after the date of enactment of this section,
23 on a showing by the owner or operator of any such unit that
24 good faith efforts were made to satisfy such requirement but
25 the unit will fail to do so for reasons not in control of the

1 owner or operator of such unit. No variance granted under
2 this paragraph shall extend for a period longer than seventy-
3 two months after the date of enactment of this section.

4 “(5) If the Administrator fails to promulgate regulations
5 under subsection (a) for the disposal of ash from municipal
6 incineration units, no person may dispose of ash in a landfill
7 after forty-eight months after the date of enactment of this
8 section unless such landfill satisfies the requirements of sub-
9 sections (b)(1) or (b)(3).

10 “(m)(1) Beginning on the effective date of any regula-
11 tion or requirement under this section it shall be unlawful to
12 manage, handle, store, treat, transport, reuse, recycle, or dis-
13 pose ash from a municipal waste incineration unit otherwise
14 than in accordance with such regulation or requirement or a
15 State program approved pursuant to subsection (i).

16 “(2) Prior to and after the effective date of regulations
17 under this section, the Administrator may use the authorities
18 of section 3008 to enforce the requirements of this section. In
19 the case of a violation in a State which is authorized to im-
20 plement and enforce a program under subsection (i), the Ad-
21 ministrator shall give notice to the State in which a violation
22 has occurred prior to issuing an order or commencing civil
23 action under section 3008.”.

1 (b) The table of contents for subtitle D of the Solid
2 Waste Disposal Act is amended by adding the following new
3 item at the end thereof:

"Sec. 4011. Municipal waste combustion ash."

4 (c) Subsection (i) of section 3001 of the Solid Waste
5 Disposal Act is repealed.

6 CONSULTATION

7 SEC. 4. Notwithstanding the provisions of the Federal
8 Advisory Committee Act, prior to promulgation of any regu-
9 lations, requirements, or guidelines pursuant to this section,
10 the Administrator shall consult with elected officials of State
11 and local governments, or their representatives or represent-
12 atives of their organizations which may develop plans, ad-
13 ministrator programs, issue permits, promulgate regulations or
14 take corrective action under this section to receive their
15 advice and recommendations on such regulations, require-
16 ments and guidelines.

○